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THE IMAGES OF HUMAN NATURE IN ECONOMICS

by
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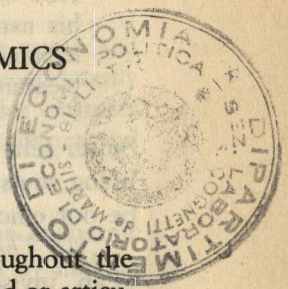

The views and assumptions regarding human nature throughout the history of economic thought have not always been explicitly stated or articulated by the economists of the time. Often economists' images of human nature and behavior must be put together from indirect statements and implicit assumptions. Even so, it is evident that various distinguishable images have existed throughout the history of economic thought, and the image has changed, although slowly and sometimes only subtly, over time. Thus, it can be argued that economists have generally recognized the need to at least implicitly define the behavioral and motivational characteristics of the individuals which they analyze even if the image is based simply on casual observations by the economist or, as often seems the case, represents his value judgments.

The purpose of this paper is to trace the evolution of the image of human nature in economics from the time of Adam Smith to the modern period. Many of the images closely resemble the "economic man" although some economists have had an altruistic or less than totally rational image. Modifications, qualifications, and shifts in emphasis from one economist to another serve to distinguish the images one from another and to focus attention on distinct aspects which were considered important.

Adam Smith: Sympathetic Self-interested Image

Adam Smith (1723-1790), the "father of modern economics", first became well-known with the publication of *The Theory of Moral Sentiments* in 1759 in which he attempted to identify the sources of moral judgments. Although Smith viewed man as self-interested, he also viewed him as capa-

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ble of making moral judgments on the basis of considerations other than selfishness. This was brought about by the principle of sympathy – the ability to put oneself in the other person's position.

> How selfish soever man be supposed, there are evidently some principles in his nature which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it [1].

Smith felt that we even sympathize with the dead by putting "our own living souls in their inanimated bodies, and thence conceiving what would be our emotions in this case" [2].

In *The Theory of Moral Sentiments*, Smith first introduced the notion of an "invisible hand", and it is quite different from his later use of the term in *The Wealth of Nations* [3]. He originally viewed the invisible hand as a natural and divine force which impels the rich to share their wealth with the poor.

> [The rich] ... though they mean only their own convenience, though the sole end which they propose from the labours of all the thousands whom they employ be the gratification of their own vain and insatiable desires, they divide with the poor the produce of all their improvements. They are led by an *invisible hand* to make nearly the same distribution of the necessaries of life which would have been made had the earth been divided into equal portions among its inhabitants; and thus, without intending it, afford means to the multiplication of the species [4]. [Italics mine]

Smith analyzed human conduct according to three sets of motives: self-love and sympathy; the desire to be free and a sense of propriety; the habit of labor and the propensity to exchange; each of which acted as a check and balance so that each person pursuing his own self-interest promoted the public welfare. This was because Providence had made a society governed by natural order wherein the different motives of human behavior were balanced. Generally, then, Smith's philosophy was very optimistic. When Smith applied his notions of natural order to the economic sphere, it is evident he is opposed to government intervention in the private sector, advocating instead a laissez-faire approach.

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[1] SMITH (1976, p. 47).
[2] *Ibid.*, p. 53.
[3] SMITH (1937).
[4] SMITH (1976, p. 304).

Some historians of economic thought tend to view the importance Smith placed on self-interest, productivity, and thriftiness in *The Wealth of Nations* as inconsistent with his emphasis on altruism in *The Theory of Moral Sentiments*. Thus Smith describes human nature in *The Wealth of Nations*:

> The desire of bettering our conditions comes with us from the womb and never leaves us until we go to the grave ... Every individual is continuously exerting himself to find out the most advantageous employment for whatever capital he can command ... There is a certain propensity to truck, barter, and exchange one thing for another [5].

According to this view, Smith laid the early foundation for the economic man. Moreover, Smith tried to justify the pursuit of self-interest by making it seem natural and by arguing that it promotes the public good – the wealth of the nation – so long as it is restrained by the invisible hand of competition.

> An individual neither intends to promote the public interest nor knows he is promoting it ... He intends only his own gain, and he is led by an invisible hand to promote an end which was no part of his intention ... It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their self-interest. We address ourselves not to their humanity but to their self love, and never talk to them of our necessities, but of their advantages [6].

To reconcile the two doctrines, one could argue that Smith viewed individuals in both *The Theory of Moral Sentiments* and *The Wealth of Nations* as self-interested but that their self-interest is restricted in different ways. In *The Theory of Moral Sentiments*, man's self-interest is curbed through sympathy. In *The Wealth of Nations*, self-interest is restrained by competition. Thus, both of Smith's works reconciled the individual interest with the social interest through an invisible hand resulting in natural harmony.

Jeremy Bentham: Hedonistic Image

The contributions of Jeremy Bentham (1748-1832) are important in

[5] SMITH (1937, pp. 73, 324, 421).
[6] SMITH (1937, p. 421).

the history of economic thought because he attempted to obtain a measurement of social welfare employing the principle of utilitarianism – the greatest good for the greatest number. Thus an ethical limitation was imposed in that human conduct should result in the happiness of the greatest number. According to Bentham, mankind is governed solely by pain and pleasure, with self-interest as the main motive of human conduct.

> Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do as well as to determine what we shall do. On the one hand the standard of right and wrong, on the other the chain of causes and effects, are fastened to their throne. They govern us in all we do, in all we say, in all we think: every effort we can make to throw off our subjection, will serve but to demonstrate and confirm it [7].

Bentham thought that pleasures and pains differed quantitatively but not qualitatively, and no pleasures were morally superior to others. In order to measure social welfare, Bentham used felicific calculus which involved a calculated balancing of pleasures and pains.

The emphasis of utilitarianism on the existence of subjective needs of individuals made evident a possible conflict with the requirements of the economic system since man's primary goal was now the pursuit of pleasure and the avoidance of pain. Work involved pain, and that pain must now be weighed against the pleasures of the returns from work. Smith's notion of rational, hard-working, and productive individuals must be modified to accommodate the notion of perhaps irrational, human desires as the primary objective which could often be in conflict with the objectives of the market economy.

However, an ethical limitation was imposed in that human conduct should lead to the happiness of the greatest number. Thus, Bentham, like Smith, imposed limitations on the extent that man may harm his fellow man in the pursuit of his own self-interest.

David Ricardo: Heroic Capitalist Image

David Ricardo (1772-1823) was one of the first major political economists to place great emphasis on the analysis of the distribution of income rather than on production and the growth of income. Ricardo accepted the

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[7] BENTHAM (1948, p. 1).

notion that individuals sought their own gain via Bentham's notion of felicific calculus of the measurement of pleasures and pains. He analyzed the distribution of income in terms of three economic classes – landowners, capitalists, and laborers. Unlike Adam Smith, he did not envision a harmony of interests but rather opposing interests among the economic classes. In particular, he stated that "the interest of the landlord is always opposed to the interest of every other class in the community" [8]. Landlords were not viewed as being especially productive, and they were always reaping that which they had not sown, thus diverting funds away from the productive industrial capitalists. Thus, rents and profits were viewed as being inversely related.

The capitalist tended to represent the "hero" of Ricardo's analysis as Ricardo embraced Smith's Protestant ethic orientation of individuals in his view of capitalists. Instead of regarding all individuals as economic men, the capitalist typified the Ricardian economic man, his primary motivation being to earn profits and reinvest them, thus leading to the economic progress of society.

Ricardo viewed workers as being condemned to a life of subsistence, their primary diversion being the pursuit of sexual pleasure resulting in more mouths to feed and eroding any increase in income they might have temporarily gained [9]. It is apparent that Ricardo did not have a very high regard for the working class, and he felt that the Poor Laws only served to reinforce their undesirable characteristics.

> The clear and direct tendency of the poor laws ... is not, as the legislature benevolently intended, to amend the condition of the poor, but to deteriorate the condition of both poor and rich ... The nature of the condition points out the remedy. By gradually contracting the sphere of the poor laws; by impressing on the poor the value of independence, by teaching them that they must look not to systematic or casual charity, but to their own exertions for support, that prudence and forethought are neither unnecessary nor unprofitable virtues, we shall by degrees approach a sounder and more healthful state [10].

At the same time, Ricardo was generous with his own wealth, completely supporting two almshouses at his own expense. Ricardo was rather pessimistic regarding the effectiveness of education in leading to greater

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[8] Ricardo (1926, p. 235).

[9] Ricardo (1911, p. 53).

[10] *Ibid.*, pp. 61-62.

prudence on the part of the laboring masses for he felt they were noneconomic men ruled by emotion and were generally satisfied living at the subsistence level. However, he felt that if workers could experience at least one generation of prosperity, they might become so accustomed to it that they would behave prudently thereafter.

John Stuart Mill: Liberal Humanitarian Image

John Stuart Mill (1806-1873) felt that the analysis of human behavior was fundamental to "all reasoning in political and social affairs" [11]. Mill viewed human nature as being governed by natural laws, and as such, remained constant over the course of time.

> Men ... in a state of society are still men; their actions and passions are obedient to the laws of individual human nature. Men are not, when brought together, converted into another kind of substance, with different properties, as hydrogen and oxygen are different from water ... Human beings in society have no properties but those which are derived from ... the laws of nature of individual man [12].

Mill felt that government has a responsibility for encouraging individual development. He stated that "a government cannot have too much of the kind of activity which does not impede, but aids and stimulates, individual exertion and development", and that precedence must be given to the "mental expansion and elevation" of individuals [13].

In his early twenties, Mill experienced a mental breakdown which he attributed in his *Autobiography* to a strong feeling of guilt in having accepted Jeremy Bentham's utilitarianism. Afterward, Mill became very critical of various aspects of utilitarianism, particularly Bentham's view that human behavior is entirely governed by self-interest. In fact, he went so far as to suggest that the reason Bentham ignored the importance of sympathy and altruism was because Bentham, himself, was lacking in these qualities[14]. The implication here is that Mill was not lacking in them, and this fact is supported by his great concern with income and wealth distribution and the possibilities for redistribution. Mill seemed to hold out hope that, in the stationary state, man would be more highly motivated to turn to altruistic

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[11] Mill (1888, p. 283).
[12] Mill (1941, p. 573).
[13] Mill (1956, pp. 140-141).
[14] Mill (1950, pp. 61-63).

concerns. Mill never totally abandoned the utilitarian principle, however, in that he continued to argue that the morality of human behavior should be judged by its effects on human happiness.

In general, then, Mill's conception of human nature was liberal humanitarian. It was liberal in the sense of placing great importance on the individual and on individual development and of viewing individual liberty as being of prime importance. It was humanitarian in the sense that Mill viewed man as being basically unselfish – if not in the present, at least in the future, when the stationary state will prevail. It is apparent from Mill's mental crisis that he agonized over the reconciliation of these two points of view. And many economists are still agonizing over this same problem today.

Karl Marx: Class-Conscious Image

Karl Marx (1818-1883) viewed man as being a product of the type of society in which he lived, and the type of society, in turn, was determined by the ownership of the means of production. In a more general sense, Marx viewed man as being a product of nature. Marx stated:

> ... the first fact to be established is the physical organization of these individuals and consequent relation to the rest of nature ... Men ... begin to distinguish themselves from animals as soon as they begin to produce their means of subsistence, a step which is conditioned by their physical organization. By producing their means of subsistence men are indirectly producing their actual material life [15].

Marx rejected the assumption of the economic man, and he argued that the classical economists' image of man was based on the image of the bourgeois of their own day. Like Ricardo, Marx analyzed individuals in society according to economic classes. Unlike Ricardo he did not view capitalists as heroic, and he did not treat landlords separately but lumped them with industrial capitalists in his analysis of conflict between capitalists and workers.

Marx's analysis dealt with the laws of motion of society which determined social change. Marx viewed an individual's social, economic, political, and moral character as being determined by his economic class. The capitalist adopted the set of beliefs appropriate to his class position which would

[15] MARX and ENGELS (1939, p. 7).

serve to enhance that position. Marx repeatedly emphasized the acquisitive nature of capitalists. However, as capitalism advances, capitalists also begin to acquire a taste for consumer goods which tends to conflict with their desire for capital accumulation.

> At the historical dawn of capitalist production – and every capitalist upstart has personally to go through this historical stage – avarice, and the desire to get rich, are ruling passions. But the progress of capitalist production not only creates a world of delights; it lays open, in speculation and the credit system, a thousand sources of sudden enrichment. When a certain stage of development has been reached, a conventional degree of prodigality, which is also an exhibition of wealth, and consequently a source of credit, becomes a business necessity to the 'unfortunate' capitalist ... there is at the same time developed in his breast, a Faustian conflict between the passion for accumulation, and the desire for enjoyment [16].

The social character of workers was also determined by their class position. Workers were the victims of a system that dulled their emotions and intellect. Marx was strongly opposed to the view that workers were condemned to a life of subsistence because of their sexual reproductive drive, calling it a libel on the human race. Workers would ultimately adopt the ideology of Marxism as the contradictions inherent in capitalism became apparent to them. For full class consciousness to be realized on the part of workers, it was necessary for them to realize how different their interests were from those of capitalists. Marx felt that the proletariat often suffered from a false class consciousness which caused them to identify with and ally themselves to capitalists. However, business cycle crises served to illuminate and intensify the class distinctions, resulting in an inevitable class struggle leading to historical change and to changes in the mode of production which would impact all of human culture.

After the emergence of socialistic societies, the relationships among individuals would become mutually satisfying. Moreover, individuals would be able to derive satisfaction, rather than being alienated from, their work and the products of their labor.

> Assuming that we were producers as human beings (not as commodity producers), each of us would then have doubly asserted himself and others through his production ... My own true being and essence would be confirmed and embodied in my individual activity. Our products would then be so many mirrors from which our being would shine out to us ... [17].

[16] Marx (1906, pp. 650-51).

[17] Marx (1932, p. 106).

Alfred Marshall: Rational Economic Image

Alfred Marshall (1848-1924) shifted the emphasis back to economic rationality as both an ideal and the ultimate result of the operation of economic laws. He viewed economics as the study of man in the ordinary business of life. The rational, calculating, and competitive economic man again dominated economic thinking.

Marshall was greatly interested in human character growth which he thought resulted from greater economic independence and competitiveness. An individual's character is shaped by the way he earns his income as well as by how much he earns.

> For the business by which a person earns his livelihood generally fills his thoughts during the greater part of those hours in which his mind is at its best; during them his character is being formed by the way in which he uses his faculties in his work, by the thoughts and feelings which it suggests, and by his relation to his associates in work, his employers or his employees ... And very often the influence exerted on a person's character by the amount of his income is hardly less, if it is less, than that exerted by the way in which it is earned ... the conditions which surround extreme poverty ... tend to deaden the higher faculties [18].

Marshall argued that while altruistic behavior would be beneficial, it is unrealistic to assume individuals behave in this manner.

> Such is the golden age to which poets and dreamers may look forward. But in the responsible conduct of affairs, it is worse that folly to ignore the imperfections which still cling to human nature. History in general, and especially the history of socialistic ventures, shows that ordinary men are seldom capable of pure ideal altruism for any considerable time together [19].

Thus, individuals are basically deliberate and competitive which not only made individuals better off but resulted in benefits for the economy as a whole. Marshall placed great emphasis on individual freedom because he felt that the more freedom an individual had, the more rational he would become.

It is interesting that in spite of his emphasis on individualism, rationalism, and competition, Marshall viewed himself as being oriented toward

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[18] MARSHALL (1920, pp. 1-2).

[19] *Ibid.*, p. 9.

humanitarian concerns. According to Marshall, the problems of poverty in Britain were the impetus behind his work.

> I think I should perhaps say that I have devoted myself for the last twenty-five years to the problem of poverty, and that very little of my work has been devoted to any inquiry which does not bear on that [20].

Nevertheless, Marshall is not really remembered primarily for contributions dealing with humanitarian issues except in the sense that he was concerned with economic growth which often results in benefits for individuals on all levels of the economic ladder.

Thorstein Veblen: Institutional Image

Thorstein Veblen (1857-1929), viewing man within the broader framework of anthropology and biology, rejected the assumption that human behavior is rational within the economic sphere. To begin with, Veblen denied the validity of the hedonistic conception of man as one able to calculate the gains and losses associated with alternative choices available to him. Veblen viewed human action as more instinctive than reflective. According to Veblen it is necessary to view human behavior within a dynamic institutional framework. A conflict exists between dynamic and static influences on human behavior resulting in an evolutionary individual.

> Not only is the individual's conduct hedged about and directed by his habitual relations to his fellows in the group, but these relations being of an institutional character, vary as the institutional scene varies. The wants and the desires, the end and the aim, the ways and the means, the amplitude and drift of the individual's conduct are functions of an institutional variable that is of a highly complex and wholly unstable character [21].

Two psychological drives were important in human behavior – the instinct of workmanship and the instinct of emulation. Man had a natural drive to be productive and innovative and engineers would seek to devise methods of production to produce unlimited amounts of output, but big business suppressed output below its technically feasible level through institutionalized waste.

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[20] MARSHALL (1926, p. 205).

[21] VEBLEN (1961, p. 165).

Veblen viewed the individual's consumption patterns as being affected by the consumption patterns of society's wealthy leisure class which the consumer wished to emulate.

> The effect upon the serious activities of man is therefore to direct them with great singleness of purpose to the largest possible acquisition of wealth, and to discountenance work that brings no pecuniary gain [22].

Thus the individual engages in "conspicuous consumption", but this consumption does not satisfy his needs because it forces him to concentrate almost exclusively on activities which bring monetary rewards to the exclusion of other concerns.

John Kenneth Galbraith: Affluent Irrational Image

John Kenneth Galbraith (1908-) in his important work, *The Affluent Society*, also rejects the concept of the rational economic man. However, instead of individuals emulating the consumption patterns of the rich, their consumption patterns are manipulated by advertising and salesmanship which serve to create their wants.

> As a society becomes increasingly affluent, wants are increasingly created by the process by which they are satisfied. This may operate passively. Increases in consumption, the counterpart to increases in production, act by suggestion or emulation to create wants [23].

Thus, according to Galbraith, the consumer is not sovereign but is manipulated by producers into new and artificial wants which satisfy the goals of producers in what Galbraith refers to as the dependence effect. Moreover, Galbraith states that welfare may not be increased as output increases since more output only serves to create more wants.

> Wants thus come to depend on output. In technical terms it can no longer be assumed that welfare is greater at an all-around higher level of production than at a lower one. It may be the same. The higher level of production has, merely, a higher level of want creation necessitating a higher level of want satisfaction [24].

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[22] VEBLEN (1934, p. 112).
[23] GALBRAITH (1969, p. 158).
[24] *Ibid.*

Galbraith states that the affluence of consumers facilitates the implementation of the dependence effect.

> The further a man is removed from physical need the more open he is to persuasion – or management – as to what he buys. That is, perhaps, the most important consequence for economics of increasing affluence [25].

Thus, the irrational individual not only abandons his consumer sovereignty but is not necessarily happier as a result, because the greater his income, the greater are his wants which must be satisfied.

Summary and Conclusions

We began with Adam Smith's sympathetic self-interested image. Smith viewed man as being, by nature, self-interested. Man was also oriented toward hard work in production, and he was thrifty for the purpose of capital accumulation because of his innate desire for bettering his condition. At the same time, man was sympathetic toward his fellow men because his imagination enabled him to conceptualize others' feelings. For this reason, man was able to hold his self-interest in check especially in those instances where he would gain only at the expense of harming others.

Then Jeremy Bentham arrived on the economic scene with his hedonistic image and the doctrine of utilitarianism. Here the emphasis was on entirely subjective desires originating within the individual. Man's primary goal was the pursuit of pleasure and the avoidance of pain. Man did not necessarily enjoy working, and the desire for bettering his condition must now be weighed against the pain of work. There was little emphasis on objective rationality on the part of the individual as he pursued his pleasures, and much more emphasis was placed on subjective desires.

David Ricardo accepted Bentham's hedonistic philosophy of man, but he had separate images according to economic class. He embraced Adam Smith's Protestant ethic orientation in his view of capitalists. The capitalist was a heroic figure to Ricardo because of his desire to accumulate and reinvest capital leading to economic growth. The worker, on the other hand, seemed to Ricardo to be condemned to subsistence as a result of his reproductive drive. The landlords sat back and benefitted from the hard work and thrift of capitalists and the sex drive of workers. Ricardo placed little empha-

[25] GALBRAITH (1967, p. 46).

sis on altruism. His main concern regarding help for the poor was that any charity would lead to an even further deterioration of their character.

John Stuart Mill was concerned not only with what man was but also with what man could be. While he felt man's basic nature was determined by natural law, Mill was concerned that man's development would be impaired by conforming to the constraints of society. Mill wanted the greatest possible freedom for individual development. At the same time, Mill was greatly concerned over humanitarian issues, and he denied Bentham's view that man was basically self-interested.

To Karl Marx, man was a product of the type of society in which he lived, and the type of society was determined by who owned the means of production. Like Ricardo, Marx felt that man would identify with his economic class. However, unlike Ricardo, he did not view capitalists as heroic. Moreover, any character defects of workers resulted from their being the victims of a system that dulled their emotions and intellect. The relationship between the classes under the capitalist system would always be one of conflict. But this would change to a relationship of solidarity under socialism.

Alfred Marshall, in his view of man, shifted the emphasis from the satisfaction of purely subjective desires of Jeremy Bentham's utilitarianism back to the satisfaction of objective, economic desires, giving us the rational economic man. Man was viewed as totally rational and calculating as well as competitive. These characteristics not only made individuals better off according to Marshall but also promoted the interests of society.

Thorstein Veblen rejected the notion that human economic behavior was rational. Consumer behavior was based on habit and on an attempt to emulate the consumption patterns of the wealthy class. Even then, the individual did not gain satisfaction because his desire to engage in conspicuous consumption forced him to concentrate almost exclusively on activities which brought monetary rewards to the exclusion of other concerns.

John Kenneth Galbraith places great emphasis on the irrationality of man and his lack of sovereignty as a consumer. Because man's basic needs are already satisfied in an affluent society, new "needs" must be created for him by producers. In the affluent society, man is lured to the pursuit of what others have convinced him will bring him pleasure, and this dominates other rational considerations.

Having examined the various images of man throughout the history of economic thought, several important points emerge. First, every economist examined generally had some image of human behavior which incorporated certain behavioral and motivational characteristics. Economists derived their

images from two primary sources. One source was simply casual observations of human economic behavior on the part of the economist. Another important source were the value judgments of the economist regarding how man should be. Often these two sources were so intertwined that economists did not really make a distinction between what man should be and what man actually was. Finally, in order to justify their images of man, economists would often try to link up their images with what they termed laws of human nature which they were generally unable to adequately define.

The image of man that ultimately emerged from the history of economic thought and the one that the majority of economists currently subscribe to is that of the economic man. Although some of the earlier economists such as Adam Smith and John Stuart Mill focused attention on the possibilities of non-self-interested behavior on the part of individuals, the most prevalent image has been that of the self-interested individual. Another prominent aspect associated with the image of man throughout the history of economic thought is that of rationality. Incorporated into the concept of rationality was the idea of striving for maximum satisfaction through the attainment of economic rewards with minimum sacrifice and effort. Jeremy Bentham seemed to offer a challenge to this emphasis on rational objective behavior, but his challenge was counterbalanced by the influence of Alfred Marshall. The works of Thorstein Veblen and John Galbraith, as well as several other recent economists, have also attempted to challenge the assumption of rationality, but their contributions have not been generally incorporated into the mainstream of economics.

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L'IMMAGINE DELLA NATURA UMANA NELLA SCIENZA ECONOMICA

Questo articolo si propone di tracciare l'evoluzione dell'immagine della natura umana in economia dai tempi di Adam Smith sino ai tempi moderni. Sebbene gli economisti non abbiano sempre articolato esplicitamente la loro immagine della natura e comportamento umani, purtuttavia affermazioni indirette e ipotesi implicite indicano che sono esistite e si sono evolute nel tempo diverse distinte immagini della natura umana. Spesso le caratteristiche comportamentali e motivazionali sembrano basarsi su osservazioni casuali degli economisti o rappresentare i loro giudizi di valore. Molte immagini somigliano moltissimo all'"homo oeconomicus" benché alcuni economisti abbiano avuto immagini di natura umana altruistica o non del tutto razionale. Vengono esaminate tutte.

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INDIVIDUALISMO METODOLOGICO, MERCATO COSTITUZIONALE E « LA VIA BREVE » DELLA COSTITUZIONE SENZA COSTITUENTI

di
GIUSEPPE EUSEPI *

1. È opinione dell'autore che l'attuale stato della teoria, e a maggior ragione della pratica costituzionale, abbia perduto quell'attrazione intellettuale non conservatrice e non di maniera che aveva caratterizzato gli anni '60 e gli inizi degli anni '70. Questo lavoro cercherà di individuare i motivi di questo « stop al crocevia » suggerendo due ipotesi interpretative. La prima è il peso *eccessivo* che, almeno per una quindicina di anni dopo la sua pubblicazione, ha avuto il libro di Rawls [1] e la conseguente sottoutilizzazione concettuale delle implicazioni, neppure molto implicite, che si sarebbero potute trarre dagli apporti analitici di *Cost and Choice* [2].

Ho cercato di mostrare altrove [3] come Buchanan sia ritornato a sviluppare il tema di *Cost and Choice* esattamente venti anni dopo estendendo alla Costituzione l'individualismo metodologico, completandolo con una definizione di regola costituzionale in termini di assoluto relativo o assoluto relativamente assoluto. Piú avanti affronterò le implicazioni prospettiche di questo concetto; mi si consenta per iniziare qualche osservazione in retrospettiva.

Ci si può porre un interrogativo. È storicamente esistito un assolutismo assolutamente assoluto? Com'è noto, questo era l'obiettivo politico dell'assolutismo; il contributo di Buchanan può fornire una qualche utilità anche dal punto di vista della comprensione teorica retrospettiva di quel periodo, se cioè quell'obiettivo fu o meno raggiunto e perfino se esso sia concettualmen-

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[1] RAWLS (1971).

[2] BUCHANAN (1969).

[3] EUSEPI (1991a e 1991c).

te prospettabile. Sembra che si debba rispondere negativamente. Il primo e piú importante punto da osservare è che l'assolutismo non era conciliabile – neppure per i contemporanei – con l'attribuzione di un potere assoluto alla persona del re. Fu proprio per questo motivo che venne introdotta la distinzione tra re e corona o tra *rex* e *regnum*. La corona serviva a costituire la continuità della dinastia in caso di *vacatio* dovuta alla morte del re, ma serviva anche a costituire la necessaria continuità del potere nei periodi di assenza del re dal trono dovuta alle guerre. Dunque, il re, pur proclamato *legibus solutus* non era il depositario *pro tempore* di un potere illimitato quanto il capo indiscusso di una burocrazia piramidale, attraverso la quale, egli in definitiva poteva esercitare il potere.

Perfino quando, con un'evidente esagerazione Luigi XIV affermava *l'état c'est moi*, tale potere apparteneva piuttosto al re, solo in quanto capo di un'organizzazione di intendenti che fungevano da agenti di un principale i cui interessi collidevano fortemente con quelli della nobiltà terriera locale. Dunque, perfino l'assolutismo non fu cosí *assoluto*, non fu una personificazione del potere, ma il prevalere di una struttura burocratica, gerarchica che non godeva di diritti formali ma che non escludeva affatto che avesse un suo proprio potere. L'assolutismo fu in realtà uno stato a stati ma mai un blocco omogeneo privo di conflittualità. È appena il caso di notare che quando vi è conflittualità ogni contesto diventa provvisorio *ex ante* e, quindi, ogni assoluto si trasforma di necessità in relativo. Un secondo aspetto merita di essere segnalato perché funzionale al nostro discorso ed è che anche nell'assolutismo vi era una costituzione sostanziale e che quindi quando i movimenti liberali del XVIII e XIX secolo a partire dai rivoluzionari americani a quelli francesi lottavano per « la costituzione », non lottavano in realtà per una costituzione *tout-court* ma per una costituzione *diversa* che desse le necessarie garanzie di libertà. Questo aspetto mostra che con l'etichetta di costituzionalismo può designarsi tutto e il contrario di tutto. Da qui la rilevanza della qualificazione « contrattualistica » che designa una particolare visione della costituzione che è importante in quanto si basa sul consenso e non perché venga semplicemente subita [4].

Vi è un elemento distintivo per il quale il costituzionalismo è contrattualistico rispetto al costituzionalismo come indifferenziato punto di parten-

[4] Una costituzione universale è ovviamente postulata anche da San Tommaso, il quale, in riferimento al mondo terreno che qui ci interessa, si rivolge al principe come a colui che è incaricato *di* una collettività e non da una collettività e aggiunge che nonostante vi siano delle leggi tiranniche l'osservarle rende buoni. La logica che sta dietro a queste espressioni rimanda a una monarchia assoluta che ha Dio come archetipo e in questo senso costituisce l'unico assolutamente assoluto.

za; vi è cioè un dualismo ineliminabile tra il consenso espresso dalla « ragione universale » e il consenso espresso tramite il contratto. I due elementi che si trovano spesso indifferenziati nei primi filosofi della democrazia e che non rendono sempre agevole l'interpretazione potrebbero essere separati partendo rispettivamente dalla posizione di Rousseau del contratto sociale rispetto alla posizione di Kant ovvero del contratto politico. Mentre dalla posizione di Rousseau il consenso genuino è quello della volontà generale che è geneticamente diversa in quanto obbedisce a un canone superiore rispetto alla volontà di tutti e che ha come risultato una normativa che trascende i contraenti potenziali, il contratto di cui parla Kant e il conseguente consenso che ne discende non rinvia ad una universalità della ragione che sia del tutto esterna agli individui; rimanda invece ad una *razionalità relativa* che si risolve nella volontà della maggioranza che non ha nulla di assoluto in quanto il risultato di volontà di individui diversi che convengono su un certo numero di norme – valori – ma che rimangono tra loro diversi. In sostanza, la volontà generale o la razionalità universale costituiscono il presupposto per una sorta di decisore di ultima istanza, infallibile, superiore e che, in quanto tale, si sottrae ai normali controlli della giustizia costituzionale.

Quest'approccio è alternativo a quello contrattuale il cui elemento distintivo è quello del *limite* ed è vincolante nella misura in cui il limite sia rinegoziabile, il che preclude che non si trasformi in assoluto neppure in via di fatto. Per questa via la permanenza del nocciolo costituzionale o *grundnormen* nel senso di Kelsen, non costituisce l'equivalente della volontà generale ma il permanere o la riconferma del consenso espresso. Di conseguenza, la stabilità risulta *ex ante* a tempo indeterminato, non risulta, invece, *ex ante* non rinegoziabile come avviene nel caso della volontà generale. Ciò non può sorprendere, dal momento che la volontà generale non è interessata al consenso degli individui ma alla determinazione di obiettivi la cui validità prescinde del tutto dalla valutazione individuale; non si tratta qui della fissazione di processi che risultano in qualche modo neutri rispetto agli obiettivi, si tratta, invece, della fissazione degli obiettivi assumendo che i processi decisionali siano irrilevanti. È ovvio, quindi, che il risultato della volontà generale sfoci nella pianificazione economica laddove il contrattualismo, genuinamente individualistico, non è interessato alla fissazione di obiettivi che rimangono di competenza degli individui; esso è interessato alla fissazione di regole tali da rendere quegli obiettivi mutuamente compatibili *ex ante*. Ciò è possibile solo a condizione che il *mercato costituzionale* sia un mercato libero. Ma un mercato libero non è un mercato senza regole: è un mercato senza divieti d'ingresso ed è un mercato in cui sia esplicito che il

mantenimento di regole è un elemento meritorio dal momento che i governi sono interessati, in assenza di costituzione fiscale vincolante, a violare quelle regole che eventualmente non fossero esplicite.

Questo lavoro, quindi, cercherà in primo luogo di estendere l'individualismo metodologico al gioco costituzionale recuperando per questa via la motivazione individuale alla partecipazione al gioco che risulta confinata in un mondo in cui l'individuo rischiava, come nell'analisi Rawlsiana, di non avere un posto e, quindi, un interesse a partecipare. La seconda ragione dello « stop al crocevia » è probabilmente la scarsa attenzione dedicata alle istituzioni reali dei singoli paesi [5]: da questo secondo punto di vista il modello non serve a spiegare il passaggio anarchia-ordine, inefficienza-efficienza, ma quale ordine alternativo è possibile a partire dalle *istituzioni presenti* intese come valori non assoluti e non necessariamente o comunque non piú condivisi dagli *individui* o dai loro *rappresentanti* in Parlamento. Gli *individui* e i *rappresentanti*, quando i valori istituzionali sono, o sembra che siano vincoli all'operare anziché limite per operare, non necessariamente hanno lo stesso ruolo anche se entrambi potrebbero accordarsi nel senso della difesa ad oltranza dello *status quo* attuando, quindi, un comportamento strategico consentito dalla sistematica e lenta erosione delle regole costituzionali a danno delle generazioni future. In questo senso, la Costituzione scritta diventa altra cosa dalla Costituzione in atto e, a meno che non si prendano provvedimenti tesi ad introdurre la logica costituzionale nel modello di comportamento prevalente del mercato politico adottando il modello « a due livelli », la Costituzione si trasforma in un ideale che serve semplicemente a rendere permanente e definitivo lo *status quo*: il contrattualismo concettuale che è alla base del costituzionalismo democratico scompare e con esso l'individuo come unità decisionale. A questo punto la Costituzione diventa affare di pochi e il mercato politico non trova piú limiti o argini e si trasforma in un oligopolio tirannico.

Il dibattito che ha luogo da alcuni anni in Italia può costituire il punto di partenza per il superamento dello *iatus* tra la teoria che è divenuta forse troppo astratta e il mercato politico che è diventato troppo miope o troppo monopolistico o collusivo e non disposto a correre il « rischio del cambiamento ». Mostrare che questo *iatus* è il risultato dovuto al disinteresse che il mercato politico è riuscito a creare attorno alle istituzioni è uno dei risultati di questo lavoro.

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[5] Francesco Forte ha mostrato i diversi significati di *giustizia* e i diversi significati di tassazione ottima che emergono a livello CEE. Questo modo di procedere è in prospettiva molto promettente anche dal punto di vista teorico. Per i problemi connessi all'armonizzazione nel contesto giustizia-tassazione ottima cfr. FORTE (1990, specialmente il capitolo 2).

2. Dal punto di vista teorico, l'assunto dell'*homo oeconomicus* – interessato com'è esclusivamente al calcolo delle utilità *proprie* espresse in unità monetarie – è apparso eccessivo [6]; ciascuno, in qualche modo, tiene conto anche degli altri specialmente se intesi come controparte di un contratto concettuale e ciò perché nel suo calcolo *interno* diventa rilevante la reazione attesa della controparte o anche perché l'atto gli procura un piacere che gli deriva dal riconoscimento esterno [7]. Chiaramente in questo caso esistono effetti esterni positivi per i fruitori mentre i costi privati non hanno contropartita in flussi monetari o in contropartite fiscali.

In linea di principio, la decisione privata potrebbe anche tener conto degli effetti sui terzi, che per definizione sono estranei al contratto; ciò, naturalmente, non significa che la valutazione che ha luogo in questo caso, prima che la decisione venga assunta, costituisca il surrogato della valutazione dei terzi. Rigorosamente parlando, infatti, i terzi non possono entrare nella valutazione di A in termini di suoi costi di opportunità surrogati di B: si tratta, infatti, delle valutazioni di A circa la reazione che B avrà di fronte a una sua scelta; ma ciò, in quanto previsione di A, costituisce il costo atteso da A e, sotto questo profilo, incide sulla sua scelta. Rimane comunque il fatto che questi costi attesi di A su B non possono essere quelli di B, anche per il fatto che, *ex ante*, le informazioni di B sulle scelte di A sono necessariamente minori e probabilmente sono vicine allo zero *in assenza di regole*, rispetto a quelle di A che sceglie. L'opposto discorso vale ovviamente nel caso che a scegliere sia B.

Il semplice modello relazionale A-B non suggerisce – o almeno non sembra suggerire necessariamente – l'impossibilità di calcolare il costo, indica invece la necessità di eliminare dal gioco il contesto da dilemma del prigioniero, il quale effettivamente rende le previsioni soggettive ragionevolmente impossibili. L'introduzione di regole fornisce informazioni ad entrambi i giocatori rendendo le loro scelte reciprocamente meno rischiose e, quindi, piú efficienti e ciò non contraddice il fatto che la scelta dei singoli giocatori deve mantenere la propria libertà e, quindi, in qualche modo la propria erraticità. La necessità della regola costituzionale come regola *relativamente assoluta* serve ad evitare, nel maggior grado possibile, tutte le illusioni finanziarie e monetarie che rendono il contesto di scelta di A un

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[6] Cfr. EUSEPI (1991a) e la letteratura ivi citata, specialmente KNIGHT (1928, 1934 e 1935). Per un contributo teorico pure in chiave soggettivistica delle argomentazioni svolte nel testo cfr. FORTE (1973 e soprattutto 1991), specialmente la critica a PARFIT (1986) a cui si fa riferimento anche piú oltre nel testo.

[7] È questo probabilmente un punto chiave per la diffusione del volontariato che trova spiegazioni parziali o ideologiche se si fa ricorso a valori assoluti.

atto mentale illusorio giungendo perfino a nullificare il valore conoscitivo del consenso [8].

A livello di scelta costituzionale e nella logica delle riforme costituzionali che qui interessa vi sono i valori comuni che ispirano l'ordinamento o sistema sociale esistente [9]. Non si tratta, quindi, come opportunamente suggerisce Forte di « tutti i valori » [10] ma solo di quelli che costituiscono, per cosí dire, il denominatore comune, intesi come regola del confronto. Tale regola *è costituzionale* non nel senso che definisce un valore assoluto come il valore della giustizia in sé, ma la procedura, uguale per tutti, per la giustizia, la quale in quanto finisce con l'essere il risultato, può variare, dipendendo da decisioni interne e, quindi, successive a quella della regola fondamentale.

In sostanza, il processo tende a definire l'uguaglianza del cittadino di fronte alla regola, e cioè fissa l'impossibilità di crearsi una propria regola o una regola nella regola.

3. Il problema presentato sopra non esclude che ogni cittadino possa avere un peso diverso nella riforma della regola; in questo caso il vincolo costituzionale rimane ma il fitto velo di Rawls si trasformerebbe in « male pubblico » in quanto ridurrebbe la regola costituzionale ad un astratto esperimento mentale in cui il connotato empirico, indispensabile nella teoria della conoscenza kantiana, cade e la conoscenza di Rawls diventa un prodotto della logica pura o della ragione pura che manca dei requisiti della conoscenza kantiana [11]. Se il velo di Rawls è fitto emergerà nelle riforme costituzionali-istituzionali il problema del libero battitore, poiché *ex ante* diviene chiaro all'individuo che è possibile ricevere i benefici – in quanto sono uguali per tutti – senza sopportare il costo della negoziazione. Da qui la regola di Rawls diventa *indifferente* agli individui e, quindi, il loro coinvolgimento nelle riforme comporta *ex ante* un costo di cui non potranno essere compensati a livello post costituzionale.

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[8] A tutt'oggi la trattazione piú straordinaria di questa tematica appartiene a PUVIANI (1972, 1973 e da ultimo 1975). Su questo punto vedi FORTE e MOSSETTO (a cura di) (1972, Sez. III), BUCHANAN (1960) e il mio articolo (EUSEPI, 1989, specialmente paragrafi 5-7).

[9] Su questo punto cfr. CRISAFULLI (1970), il quale però intende come ordinamento un qualcosa di assolutamente assoluto. La tesi svolta nel testo rimanda perciò a KELSEN (1960) che costituisce la versione kantiana piú lineare e differisce sostanzialmente, almeno a mio avviso, dalla posizione di Rawls.

[10] La posizione di Forte della non esaustività dei valori costituzionali serve a mantenere al mercato politico i valori che chiamerei secondari, elemento questo rilevante e che distingue o dovrebbe distinguere il mercato politico dal mercato economico. Cfr. anche SEN (1982).

[11] Si noti che per Kant, diversamente da Hegel, non vale il detto spinoziano « *exentia involvit existentiam* »; pensare e conoscere sono attività diverse: la conoscenza prevede *necessariamente* l'elemento extra-logico, cioè l'elemento empirico.

Problemi perfino piú seri di quelli di Rawls emergono se si parte dall'analisi di Parfit [12]. Nel suo caso, infatti, l'*ex ante* costituzionale e perfino l'*ex ante* post costituzionale è difficilmente pensabile in quanto vi sono relazioni tra io diversi in tempi diversi e non due livelli decisionali diversi di un io che, in qualche modo, si determina come flusso di coscienza di sé. Qui non si discute in linea di principio che il legame degli interessi che avranno luogo in un futuro lontano rispetto all'io che decide qui ed ora possa attenuarsi (sperimentalmente ciò si potrebbe descrivere con un tasso d'interesse che nel lungo periodo tende a zero anziché aumentare) e non si discute neppure – e questo in modo piú convinto anche perché contraddice fortemente l'assunto precedente – che esiste una maggiore consapevolezza della stabilità delle sensazioni presenti non ultimo per il fatto che le valutazioni presumibilmente variano. Il punto è che la variazione delle valutazioni non è imputabile all'esistenza di tanti io temporali ma ad un unico io – un individuo con nome e cognome ecc. [13]. La trasformazione dell'io non è indipendente dai vincoli costituzionali inizialmente assunti e la scelta da nessun luogo rende le riforme virtualmente impossibili dal momento che le riforme hanno luogo necessariamente in un luogo e d'altra parte la prospettiva da nessun luogo non può costituire un'alternativa per qualcuno. Il vincolo fiscale ad esempio è un vincolo di prudenza [14] per gli individui futuri e qualora si rivelasse il contrario, gli individui futuri avrebbero la facoltà di rinegoziare il contratto costituzionale dal quale si ritenessero danneggiati. Ma perfino se si ammettesse che la rinegoziazione costituzionale possa costituire un onere eccessivo, la scelta da nessun luogo continuerebbe a rimanere un'alternativa impraticabile: chi sa scegliere e per chi da nessun luogo?

L'unico modo con cui sembra ragionevolmente acquisibile l'imparzialità delle regole costituzionali non è quello di cacciare i costituenti e di porli nel *limbo di nessun luogo* ma quello di pensare regole costituzionali valide per un tempo indeterminato [15].

In conclusione, sia il velo rawlsiano, sia la decisione da nessun luogo visti dall'angolatura delle riforme costituzionali degli anni '90 appaiono esperimenti mentali e non impostazioni procedurali utilizzabili per riformare le costituzioni e le istituzioni esistenti. Per questo motivo, appare opportuno

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[12] PARFIT (1986).

[13] Per un'ampia discussione su questo punto vedi EUSEPI (1987).

[14] Questo punto è stato sollevato con forza da Buchanan nel 1958 alla luce del fatto che quella che egli chiamava "*the old time fiscal religion*" che portava di per sé all'equilibrio di bilancio, era stata sostituita dalla filosofia della flessibilità rispetto alla quale il vincolo diventa « un male pubblico ». Cfr. ad esempio, GIOVANNINI e SPAVENTA (1991) e ROWLEY (1987).

[15] Cfr. BRENNAN e BUCHANAN (1985, specialmente cap. V).

battere vie diverse. Anche se ciò comporta l'abbandono di edifici che sembrerebbero perfetti ma che sono inabitabili per gli individui degli anni '90.

4. Quando, agli inizi degli anni '60, uscí *The Calculus of Consent* [16] l'obiettivo era quello di canalizzare l'attenzione alle decisioni non di mercato, agli ordinamenti istituzionali che consentono la coesistenza di comportamenti politici potenzialmente conflittuali. Questo era abbastanza poiché il prevalente modello neoclassico era interessato all'equilibrio tramite lo scambio dando per scontato che a livello individuale esso era acquisito automaticamente: in questo senso le istituzioni venivano poste tra le ipotesi o tra i dati del problema. Posizione contraria alla Costituzione e alla regola era poi quella portata avanti dai neokeynesiani che vedevano in essa il vero ostacolo ad attuare fino in fondo la politica della piena occupazione. Fu proprio alla fine degli anni '60 e agli inizi degli anni '70 che ebbe luogo un periodo di particolare interesse per l'approccio qui portato avanti. Si tratta della collaborazione, breve, ma molto significativa, tra Buchanan e Bush [17] e che si rivolge al costituzionalismo, come alternativa all'anarchia partendo dall'individuo e in termini di costi di opportunità di questi.

Occorre tuttavia notare, che fino ad anni recenti [18], gli sviluppi del costituzionalismo non sono stati cosí promettenti come i contributi della scuola della Virginia avrebbero lasciato sperare e la materia è andata sempre piú indirizzandosi verso la filosofia politica che tende a cercare piú la compatibilità del modello che il consenso degli individui reali. Da qui, il consenso su una Costituzione non poteva essere il risultato delle scelte degli individui o dei loro rappresentanti *pro tempore*, ma l'accettazione di un concetto di giustizia la cui approvazione era data in termini di coerenza del concetto in sé, come parametro assoluto o *principio primo* su cui *individui astratti* perfettamente incerti non possono che concordare. In questa ottica l'apparato istituzionale-costituzionale *evita* e non *supera* i conflitti di interessi che non potranno che manifestarsi, perfino accresciuti, a livello post-costituzionale.

Se agli individui fosse dato di scegliere nel gioco costituzionale, il concetto di assoluto rimarrebbe al di là delle loro volontà in quanto l'assoluto esclude per definizione la scelta [19]. Ed è per questo che l'impulso dato dal

[16] Buchanan e Tullock (1962).

[17] Buchanan e Bush (1974).

[18] Cfr. Buchanan (1989).

[19] Se fosse possibile inserire l'assoluto assoluto all'interno del concetto di scelta, cosa che ovviamente non è, *ipso facto*, l'assoluto diverrebbe assoluto relativo. Questa distinzione non è puramente terminologica in quanto sposta l'attenzione da una conoscenza assoluta, che prescinde *in toto* dall'agente che conosce, alla conoscenza relativa in quanto cioè risultato dell'azione

libro di Rawls non va nella direzione auspicata qui. Individualismo significa partire dagli individui reali e non da individui ideali o idealizzati; l'idealismo ha commesso fin troppi misfatti negli ultimi due secoli, sia nella versione di destra sia nella versione di sinistra [20] per avere seria udienza nella prospettiva delle riforme costituzionali se non si vuole che tali riforme consistano in un panegirico dello stato. Il costituzionalismo non è la superiorità dello stato o della dottrina dello stato, è la superiorità della dottrina delle regole [21], la superiorità dei processi che diventano *imperativi* in senso kantiano, cioè etico, solo se gli individui non sono esclusi dalla eventuale rinegoziazione o revisione della Costituzione. È questo il punto decisivo e non il fatto che l'assenso alla Costituzione esistente sia stato effettivamente espresso dagli individui viventi; quest'ultima infatti, è un'argomentazione di per sé fuorviante oltre che banale: se la Costituzione deve durare può essere posta a *referendum* potenziale, ma non *deve* essere posta a *referendum* sistematico. Non appare, infatti, rilevante l'argomento dell'approvazione postuma di una Costituzione promulgata quando gli individui esistenti non erano nati; quest'approvazione implicita è importante quando quella regola continua a rimanere inalterata, ma quando ci si pone in un'ottica dinamica, ciò che diventa rilevante per l'individuo che partecipa al gioco costituzionale è la rinegoziazione prospettica da parte della generazione vivente. Da questo punto di vista il problema è quello del costo come ostacolo alla decisione, è, cioè – per il fatto stesso di essere un ostacolo – un concetto *ex ante* e non *ex post*.

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del conoscere che può essere sí individuale o organizzata, ma inevitabilmente considera l'agente – l'organizzazione di agenti – che conosce come origine delle valutazioni. Mentre da quest'ultimo punto di vista costituzionalismo significa quasi per necessità contrattualismo, essendo il contratto per definizione il metodo per il consenso tra decisori relativi, dal primo punto di vista costituzionalismo è di necessità emanazionismo che, sotto qualsiasi bandiera, si rifà allo stato come ente superiore e, quindi, primo ed unico decisore per i suoi sudditi. Le implicazioni politiche non possono essere trattate in questa sede, ma certamente non devono essere sottovalutate come emerge dalla vasta letteratura in tema di *equilibrio burocratico*. Vedi per esempio BAUMOL (1959), NISKANEN (1968), LEIBERNSTEIN (1978) ed infine BROSIO (a cura di) (1989) e ancora prima i contributi pionieristici del già ricordato PUVIANI (1972, 1973, 1975) in tema di illusione finanziaria.

[20] La tendenza di molti intellettuali a schierarsi con la maggioranza spiega perché la critica degli anni '90 sia stata essenzialmente diretta alla versione di sinistra o marxista dell'hegelismo. Occorre notare che non meno illiberale o antidemocratica è la versione di destra (Nietzsche) la cui posizione in apparenza soggettivista – ed è in questo senso che BUCHANAN lo ricorda spesso (1983) – è in realtà nichilista e finisce per questa via per far rientrare sulla scena l'oggettivismo nella forma piú pericolosa, anche politicamente, come cioè giustificazione di qualsiasi *status quo* esistente, inteso come risultato del piú forte e non come processo condiviso. Perciò i contributi che partono da quella direzione sono costituzionalmente « muti » e, quindi, non meritano di essere trattati qui.

[21] Su questo punto cfr. CRISAFULLI (1970, specialmente cap. I).

Dunque, l'individualismo come base del costituzionalismo appare la prospettiva corretta proprio perché la capacità di rinegoziazione rimane intatta pure all'interno di una stabilità che *ex ante* è a tempo indeterminato. In questo contesto, la tesi istituzionalismo = conservatorismo risulta priva di fondamento mentre appare vera la sua alternativa e cioè che l'idealismo è alla vera origine del conservatorismo etico *sui generis*: quando l'individuo è escluso per definizione dalla scelta delle regole, come dalle scelte collettive o non di mercato, tali scelte non possono che essere fatte da un decisore generale che, sotto diverse vesti, è lo stato idolatrato: esattamente cioè la negazione dell'individuo.

Non sorprende perciò se alla base di partenza dell'approccio istituzionale non può esserci la giustizia astratta, ma la regola della concorrenza dinamica che consente il risultato migliore per gli individui consumatori.

5. Gli obiettivi dell'economia costituzionale degli anni '90 differiscono sostanzialmente da quelli esclusivamente teorici o di « fondazione logica » che hanno contraddistinto gli scorsi due decenni.

Il momento costituzionale degli inizi degli anni '90 deriva da motivi *realistici* che hanno precostituito l'opportuno clima politico come base per il contributo intellettuale teorico; la fine dei regimi dell'Est, la crisi fiscale degli stati dell'occidente democratico costituiscono un privilegio particolare, che potrebbe anche essere irripetibile a favore dell'approccio costituzionalista; piú o meno apertamente e diffusamente si sta facendo avanti la convinzione per la quale gli inizi degli anni '90 costituiscono la « necessaria frattura della storia » dal cui punto osservare il prima e, quello che piú interessa in questa sede, disegnare il poi. È questa rottura della storia che consente di porre la prospettiva delle regole in un modo diverso e piú concreto ad un mondo, specialmente quello che risulta dallo sfaldamento dell'Unione Sovietica e della Jugoslavia, che rischia di portare con sé il dissolvimento dell'autorità stessa. Naturalmente, questo renderebbe impossibile la coesistenza stessa di gruppi civilmente organizzati. Ma questi problemi hanno un impatto anche sui paesi a tradizione democratica all'interno dei quali la prospettiva costituzionale non si è fatta ancora chiaramente strada almeno – ma certamente non solo – nel sistema politico italiano [22]. Comunque, le crisi dell'Est

[22] Tuttavia, non sono mancati lavori preparativi importanti, sia dal punto di vista delle riforme costituzionali, sia dal punto di vista delle istituzioni del controllo. Sul primo punto si vedano i lavori della Commissione Bozzi, sul secondo punto si veda FORTE e EUSEPI (1990). In un lavoro congiunto (EUSEPI e CERIONI, 1993) ho cercato di individuare le ragioni della scarsa attenzione ai problemi costituzionali esaminando le vicende dell'art. 81 della Costituzione italiana che è stato uno dei piú criticati anche se le motivazioni di tali critiche sono piú da

e dell'Ovest portano a ripensare ai principi costituzionali come a principi di stabilità relativamente assoluta e a prospettare quindi la stabilità che da tali principi deriva come situazione migliore rispetto all'anarchia o al caos costituzionali. Ed è esattamente in una situazione di questo genere che si trova gran parte del mondo occidentale [23].

In alcuni paesi, come l'Italia, la Costituzione scritta, o parti non trascurabili di essa, è erosa [24] e, quindi, una riforma rapida rimane l'unico modo di prevenire il caos istituzionale. Diverso e piú ampio discorso va fatto in prospettiva in riferimento ai rapporti tra Costituzioni nazionali di stati sovrani e istituzioni europee nel senso che una Costituzione europea appare il prerequisito se quella a cui si vuol giungere non deve essere un'Europa come semplice fatto di mercato se non addirittura come semplice fatto geografico. Naturalmente, il realismo che deriva dall'approccio costituzionalista degli anni '90 porta di necessità a partire dallo *status quo*, dalle istituzioni esistenti le quali devono trovare dei vantaggi se si vuole un loro gioco cooperativo. Questa logica motiva alla partecipazione tutti i giocatori precostituendo il contesto di costo che dà luogo alla scelta che non precluda i vantaggi cui la scelta dà luogo a chi ha contribuito, in termini di tempo e di abilità, a condurre in porto l'intrapresa. In questo contesto il velo rawlsiano è reso per cosí dire meno spesso o piú trasparente ma non è, né potrebbe essere integralmente rimosso; del resto questa differenziazione genuinamente individualistica rispetto alla soggettività di specie che Rawls adotta da Kant non ha come obiettivo la rimozione del velo ma quello di rendere meno lontane le posizioni individuali che possono essere assunte a livello post-costituzionale. In un'ottica di riforma costituzionale un velo particolarmente spesso, come si è accennato, azzera i vantaggi individuali prospettici e agisce in definitiva nel senso di assolutizzare le istituzioni presenti. Se gli individui non possono, almeno in parte, ragionevolmente calcolare i vantaggi prospettici, l'impegno alla partecipazione al gioco costituzionale potrebbe configurarsi *ex ante* un costo tale da rendere insopportabile la partecipazione o prezzo di ingresso al gioco costituzionale. Perché infatti sopportare costi

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individuarsi nel ruolo genuinamente costituzionale che è quello di vincolo al legislatore ordinario che nella identificazione di errori che ne suggerirebbero l'abolizione.

[23] Punto questo che include sia gli Stati Uniti che l'Europa seppure in modi diversi, come opportunamente sottolineato in due importanti studi recenti. Cfr. BERNHOLZ (1990) e BUCHANAN (1991).

[24] Si pensi all'art. 81 in tema di equilibrio di bilancio, all'art. 23 in tema di imposta e al tentativo di modificare l'art. 138 che rimane forse l'unico argine in un paese in cui il mercato politico tende ad escludere il normale ruolo maggioranza opposizione e a sostituirlo con una collusione generalizzata.

differenziali quando i rendimenti attesi sarebbero ugualmente acquisiti a costo zero? La prospettiva delle riforme costituzionali non consiste nell'impossibilità di prevedere i vantaggi per sé, ma nell'impossibilità che alcuni o molti giocatori anziché scegliere le regole, determinino il risultato [25].

Dunque è sufficiente che i giocatori non possano scegliere i risultati perché il contesto costituzionale sia operativo nel senso che *ipso facto* la scelta non può consistere che tra strategie alternative disponibili, mentre i risultati non possono essere previsti *ex ante* neppure da un individuo perfettamente razionale dal momento che le sue scelte, per attuarsi, devono essere compatibili con le scelte, a lui ignote, di individui altrettanto razionali ma diversi. Dunque il vincolo costituzionale attiene alla fissazione di stabili regole del gioco, mentre i risultati sono necessariamente variabili, dal momento che solo se le partite sono truccate il risultato può essere determinato *ex ante*. Ma a queste condizioni il gioco perde tutto il suo interesse, tale interesse rimane se e nella misura in cui gli spettatori sono ignari che il risultato è stato prefissato. Ma quale senso costituzionale o vincolo costituzionale verrebbe a costituire una qualsiasi regola? Quando si determinano i risultati *ex ante* non è piú possibile distinguere i contributi dei diversi giocatori perché i giocatori stessi non avrebbero alcuna possibilità di incidere, seppure indirettamente, sui risultati dal momento che agli individui non è lasciato alcun ruolo. Ci troviamo quindi di fronte ad una costituzione *senza costituenti*, di fronte cioè ad una democrazia senza *demos*: è una costituzione che sancisce il predominio del piú forte. Se i risultati delle riforme derivano da interazione di scelte, tali risultati cambiano se cambiano le regole. La tesi di Hayek per la quale noi non scegliamo coscientemente le regole in base alle quali giochiamo e che lo sviluppo o evoluzione culturale non costituisce una scelta razionale, non nega che ci possa essere una scelta esplicita – ad esempio l'accordo circa una costituzione CEE modificativa del trattato di Roma il cui obiettivo è quello di rendere un trattato tra nazioni un atto interno tra membri di una collettività piú ampia – e che tale scelta *in prospettiva* inciderà sulle regole dell'evoluzione politica e sociale. Ma questo contesto di regole *artificiali*, renderebbe lo sviluppo culturale diverso da quello biologico cui Hayek sembra riferirsi [26].

6. La « mentalità costituzionale », anche quella delle riforme costituzionali e non semplicemente quella che si riferisce al modello generale anar-

[25] Su questo punto cfr. BUCHANAN (1989) e FORTE (1991).

[26] Per un'analisi pregevole del concetto di norma costituzionale rispetto alla legge naturale specialmente dal punto di vista della diversa capacità previsionale, cfr. CRISAFULLI (1970, specialmente capitolo 1) e BRENNAN e BUCHANAN (1985).

chia-ordine è incompatibile o comunque contrasta radicalmente con la mentalità pianificatrice: la pianificazione attiene ai risultati mentre le riforme costituzionali attengono alle regole. Di conseguenza, il controllo del Leviatano statale è compito che spetta alla Costituzione e non può essere posticipato in quanto fenomeno di organizzazione pratica [27]. Tuttavia, le riforme costituzionali dei paesi interni alla CEE, ad esempio, difficilmente potrebbero prescindere dalla prospettiva dell'unione politica e dalla necessità di un governo centrale, che sebbene limitato da una Costituzione europea, appare l'unica prospettiva per il mantenimento della libertà degli scambi piena e generale, intesa cioè sia come movimento di prodotti, di fattori della produzione, sia come rimozione delle barriere visibili e invisibili, tecniche e politiche, che appaiono difficilmente conciliabili col concetto di sovranità illimitata dello stato nazionale. Ciò emerge analizzando l'art. 11 della Costituzione italiana che consente l'introduzione delle fonti comunitarie nell'ordinamento interno; tuttavia, « *il prezzo d'ingresso* » è anche subordinato ad obiettivi internazionali quali il mantenimento della pace a cui l'ingresso di tali fonti sembra essere confinato [28]. Vi sarebbero cioè valori costituzionali irrinunciabili che, in quanto tali, precluderebbero l'operatività di fonti internazionali, incluse quelle comunitarie nelle quali *non necessariamente* tali valori, costituzionalmente protetti, trapassano. Rimane, dunque, da risolvere il problema di eventuali attribuzioni di competenze tra singoli stati e comunità europea prospettando una qualche analogia (in riferimento al caso italiano, art. 117-120 Cost.) tra governo centrale e governo regionale in termini di legislazione di principio, che in questo contesto spetterebbe alla CEE, e legislazione di dettaglio che sarebbe di competenza dei singoli governi. Questa prospettiva, ovviamente, sembra andare oltre la logica dell'art. 11, in quanto prefigura una sovranità limitata che di per sé non è compatibile con l'assenza di una Costituzione europea della quale costituisce il presupposto logico.

7. Come ha mostrato Francesco Forte, in presenza di sovranità illimitata, tenderebbero ad emergere molto piú facilmente forme oligopolistiche [29] che sono di per se stesse incompatibili con la libertà degli scambi e questa tesi sarebbe perfettamente in linea con il concetto smithiano dell'ampiezza del mercato come limite alla domanda e alla divisione del lavoro [30]. Le

[27] Cfr. BUCHANAN (1991, specialmente par. 3). Ho cercato di sottolineare la tendenza eurocratica della Commissione CEE in materia di armonizzazione fiscale in una mia recensione a FORTE (1990). Vedi il mio scritto (EUSEPI, 1992).

[28] Vedi art. 11 della Costituzione italiana.

[29] Cfr. FORTE (1989).

[30] Si noti per inciso che l'art. 120 della Costituzione italiana prevede divieti alle regioni

riforme degli anni '90 devono quindi abbandonare l'idea di sovranità illimitata e questo anche perché la limitazione della sovranità nazionale da parte della Costituzione europea appare in prospettiva l'unico modo per impedire i nazionalismi senza, allo stesso tempo, creare un modello accentratore in grado di autoespandersi grazie alla sovranità illimitata del piú forte. L'esempio classico è costituito dalla teoria brezhneviana in base alla quale sono state consumate tragedie come l'occupazione della Cecoslovacchia nel '69 e dieci anni dopo la guerra dell'Afghanistan. Non sono affatto sicuro che la politica per la riforma delle istituzioni europee come delle istituzioni italiane si ispiri ai principi ed ai valori prospettati in questo lavoro. Le specificità, se non collidenti, devono essere costituzionalmente mantenute e non tutto può essere raccolto sotto la rubrica delle armonizzazioni: una scuola europea accentrata diventa di necessità un apparato militare napoleonico, perde i connotati dell'esperienza educativa, e in quanto tale individuale, per diventare un « caleidoscopio » di materiale di riporto, disorganico, caotico e gerarchico [31].

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concettualmente analoghi a quelli suggeriti da Buchanan per la Costituzione europea e cioè l'emergere di autarchismi e i limiti alla concorrenza interna intesa cioè sia in senso interregionale sia interfederale nel caso della costituzione di una federazione europea.

[31] Sull'importanza del sistema scolastico, in particolare sulla differenza tra scuola educativa e scuola burocratica cfr. Einaudi (1973, vol. II, cap. V). La stessa logica del resto si applica alla stampa, alla radio e alla televisione. Su questo punto cfr. Eusepi (1991b).

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METHODOLOGICAL INDIVIDUALISM, CONSTITUTIONAL MARKET, AND THE "SHORT ROUTE" TO A CONSTITUTION WITHOUT CONSTITUENTS

The paper is a first attempt to extend the subjectivist opportunity cost theory to the constitutional game. This is done using methodological individualism procedure as a tool of analysis.

The author argues that the logic of constitutional reforms – rather than the simple passage anarchy-order – is the typical context where methodological individualism represents a particularly promising starting point. From such a perspective the constitutional game cannot be considered either a neutral game, or a zero-sum game any longer. This induces the author to critically reconsider the constitutional game as a "*quasi-permanent*" public good where the "*quasi*" becomes the central core, in that it excludes both the "*absolutely absolute absolutes*", which prevent the game from being played, and the *absolutely relative relatives*, which instead prevent constitutional stability.

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THE ITALIAN PUBLIC AND PRIVATE TERTIARY SECTOR: WELL-KNOWN PROBLEMS AND TENTATIVE SOLUTIONS

by
ANNA PELLANDA *

1. *Nature of the Tertiary Sector. Time Element*

From the point of view of economic analysis the tertiary sector is synonymous with services, offered both by the State and by private organizations. To define services is a problematic matter. The first classification was attempted in the 1970s; it divided services into finished products, ready for consumption, and intermediate products to be used in industry. During the mid 1980s another classification pointed out that services in relation to added value produced, employment created and geographic location were, according to CEE and NATO statistics, of a much more complicated nature [1].

From the point of view of the History of Economics, *all* services were considered unproductive by Smith [2] while commerce was defined a "sack" by Marx [3]; *public* services, instead, were linked to the birth of the "welfare state" in the 1920s [4] and to the beginning of the State's intervention in the economy by von Mises [5].

It is certainly not easy to define the nature of services. A reason for

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[1] ISCOM (1988, pp. 317-22).

[2] SMITH (1776, book 2, ch. 3).

[3] MARX (1867, book 3, section 4, ch. 20).

[4] GLENNESTER (1990, ch. 2).

[5] v. MISES (1944).

this can be found in the difficulty to disentangle labour from capital and land. Labour exerted in services, exactly as that used in industry and agriculture, is complemented by the other two factors of production. A production function with only one independent variable is an abstract device to study average and marginal productivity but, in order to depict reality, the independent variables must be at least two. Nothing can be produced, for instance, by labour alone. Thus services, which are the typical product of labour, in order to reach the market need at least the help of capital.

Also their being usually neither material nor durable represents a difficulty, although we know what Smith forgot to consider: that a book, a document a.s.o. show that the product of labour can be materialized, can last and help further production, for instance, of human capital [6].

An element which can characterize services and distinguish them from all other products is the circumstance that the moment of production of services coincides with the moment of their demand. Services come to existence only if requested: a professional person can live, may be, very poorly, without clients, but his work cannot take place without an effective demand for it. Also banks, hotels, means of transportation can exist as fixed capital but, without customers, the services they can supply do not come into reality. A theatre performance with no audience is cancelled. A painting can be produced and demanded without being sold only because of the "inner need" of the painter to realize it. This brings us to the figure of the "prosumer" (the individual both producer and consumer) considered below while dealing with self-services. Here we can emphasize the concept of time as a mean to distinguish services from goods: time in relation to services synchronizes their supply and demand, while in relation to goods time requires to pass from the moment of production to the moment of market demand. Thus services can be, rather than durable, repeating themselves and the rate of interest, as the instrument for measuring time, is, in this context, a capitalized rather than a discount rate.

2. *Measurement and Remuneration of Services. Fiscal Difficulties*

Although human labour is the most pervasive factor of the whole productive structure, it represents the typical foundation of the tertiary sector. But, as opposed to land in agriculture and capital in industry, labour is much less homogeneous and its marginal productivity much less measura-

[6] MONTESANO (1989, pp. 13-17).

ble. Labour exerted in the field of transport, for instance, is of a different kind than labour carried on in teaching. Human capacities required by the so-called liberal professions are quite divergent from the qualities necessary to enter the public administration. A very long list of qualifications, both natural and acquired, characterizes various types of labour devoted to services. For these reasons it is difficult to give an objective definition of labour.

But the very great problem of labour exerted in the tertiary sector relates to its marginal productivity. Although productivity of services is commonly attributed to the natural endowments, capital equipment, scholastic education or technical training of people, it is very hard to know which increment of the total product has to be attributed to an increment of labour developed in services. Certainly the same concept of marginal productivity is subject to criticism [7] as it is difficult to isolate one factor of production from the others complementing it, and measure its contribution to the creation of the final product. Still the application of the mathematical instrument of the partial derivative to capital and land has furnished at least orientative results because capital and land can be reduced to some homogeneity and thus be approximately measured. This is not possible with labour due to its being made up of too different and immaterial elements which render it unquantifiable.

The above difficulty from the productive sphere is carried over to the distributive side of the question making it more or less impossible to calculate salaries of employees working in services in a fair way. This creates disputes over wages and salaries earned in agriculture and industry. In these sectors, in fact, remunerations, if not measurable to a precise degree, can certainly be ascertained more accurately than those in services. This means, at least in the Italian case, that at every action led by trade unions to obtain increased salaries and wages, people working in agriculture and industry feel less protected against inflation and unemployment. Firstly, they have the impression of being victims of discrimination, their salaries being lower in comparison with those paid for services, given the difficulty to quantify the productivity of the tertiary sector. Secondly, the Italian law does not allow [8] dismissal of people working in the public administration and this circumstance discriminates between State employees and those working in private services. Given that public employees produce services primarily, social conflicts arise in relation to unemployment, also among agricultural and industrial workers on the one hand and public employees

[7] PELLANDA (1989, pp. 22-27).

[8] D.P.R. January 10, 1957, n. 3. Art. 63, 71, 77, 84, 85, 127.

on the other. Although a law trying to change this situation is presently the object of parliamentary discussion (see Section 5), the present reality is still highly conflicting.

From the above, another difficulty arises and it belongs to the field of taxation: if services are public, their remuneration is directly taxed by the State; but when they are private, it is not easy to know the entity of earnings upon which taxes can be levied. In Italy the phenomenon of fiscal evasion, especially in the areas of commerce and the professions, is so widespread and serious to represent a negative item of public deficit. We think that, moral behaviour of Italians apart, at the root of this evil there is the lack of an objective measure for salaries in private services. A lawyer, for instance, can avoid the due taxation on his income because nobody knows how much he charges his clients. The same happens with shopkeepers, although in Italy, they have recently been compelled by law to give customers a receipt for all commercial transactions. But as "every law has a loophole" in order to grant and obtain a reduced price on the market, fewer and fewer receipts are produced and demanded! Of course the Ministry of Finance tries to levy taxes on private services by means of other devices, but the fact remains that employees of public administrations are directly taxed by the State, while those working in the private sphere can hide their true earnings and thus avoid taxation.

3. *Different Problems and Solutions for Services*

Since the 1980s public and private services have absorbed in Italy and in other European countries a higher percentage of employees in comparison with agriculture and industry. The phenomenon has been called "de-industrialization", meaning that an ever smaller number of people are employed in industry and an ever greater number in services. Today we know that we can talk of "tertiarization" of industry understanding that employment is increasing in services without decreasing in industry.

It is possible to generally look upon the tertiary sector as being the greatest source of employment in developed countries. However, public and private services differ as regards their peculiar problems and possible solutions.

At least in Italy public services deal with public goods and operate monopolistically. The private ones are instead guided by entrepreneurial criteria, concerned with problems of profit and costs and they are negatively characterized by fiscal evasion, as mentioned before.

Some possible solutions for the improvement of public services are (1) denationalization of many of them; (2) a change of legislation allowing the introduction of competition, both national and international; (3) a better technical training for employees of the sector. Solutions which could improve private services concern (4) greater attention towards consumers' demand, (5) more correct fiscal behaviour, (6) more marketing for the improvement both of the economic theory and the practical reality of services.

4. *Public Services: Problems*

The existence of public goods implies the existence of a public administration. This thesis is, however, considered too academic and some authors substitute it with the other one which maintains that public administration exists because it is "linked to the welfare of politicians who occupy important positions" [9]. Looking more deeply into the problem, the nature of public goods must be considered.

Public goods are characterized by the fact of being useful in an unconscious way to consumers (thus they cannot have a market price); moreover, they are not-divisible pro capite and cannot be rejected (like their opposite, the public evils). From this it follows that the market mechanism cannot fit the production and distribution of public goods. Usually they are services and are committed to the State which adopts political criteria for their supply and charges political prices (tariffs) for their sale. The justification for the State production of public services and for their sale at political prices, pretends to respond to criteria of social equity, that is to say, to allow also people with low incomes to receive education, medical care, justice, social security, defence (to quote only the very important public goods) at an accessible tariff.

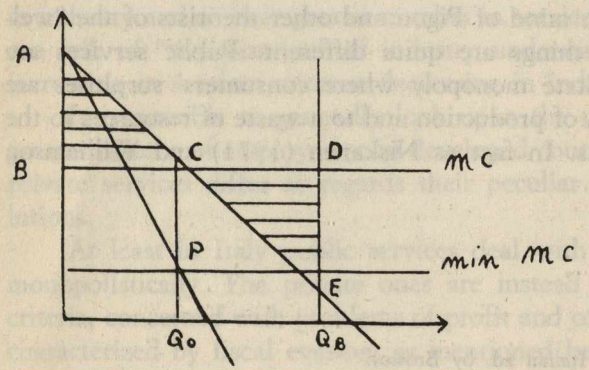
Maybe this was in the mind of Pigou and other theorists of the "welfare state" but in reality things are quite different. Public services are produced and sold as a State monopoly where consumers' surpluses are transferred to an expansion of production and to a waste of resources to the only benefit of bureaucrats. In fact as Niskanen (1971) and Williamson

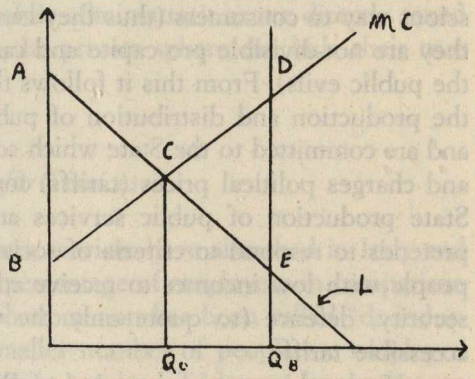
[9] Moe (1984, p. 63 of the Italian ed. by Brosio).

(1964) pointed out [10] it is not profit which matters for public managers, but the size of the public firm from which they derive political power, higher salaries and possibility of distributing social favours. The economist would comment that the slope of the demand curve and the level of costs do not matter for monopolistic producers of public goods and more generally that both efficacy and efficiency are, in these circumstances, missing. Given that these two economic prerequisites are missing also in the private tertiary, discussion of the subject is deferred there. For the time being it can be concluded that public services follow political and not economical criteria. In a sense, they conform to the model of the new institutional theory of the firm.

If the neoclassical theory is considered obsolete because it does not take into adequate consideration the institutional elements which intervene in the practical working of the firm, no better field than the State's production of public goods demonstrates this conception. According to Coase (1937) and to Simon (1947) the firm exists because it deals with transaction (not only production) costs and it uses a hierarchical organization. Transac-

[10] According to Niskanen the behaviour of bureaucrats directing public firms in a monopolistic regime can be visualized by the graph on the right where L is the demand curve, MC the marginal cost, Q_o the quantity produced efficiently, Q_B the quantity produced embodying consumers' surplus ABC. Production is expanded till $ABC = CDE$. A more complete graph could be the one below:





where Q_o is the efficient quantity because it corresponds to point P where minimum marginal cost meets marginal revenue (MR), Q_B is instead produced where $ABC = CDE$ by construction and marginal cost (MC), taken as a constant, is higher as employment is larger. See ORZECHOWSKI (1977, pp. 349 and 374 of the Italian ed. by Brosio).

tion costs are due to the fact that all market operations are considered legal contracts, and hierarchical organizations are necessary because of lack of information and perfect knowledge. Thus employees are each put in their place in order to reach satisfactory, although not optimum results. This is according to theoretical explanations, but its practical translation into reality shows that things go quite differently. In the case of public firms and at least in Italy, one can observe that managers do indeed make contracts with a view to political and social transactions at local, regional, national level [11] rather than to economic objectives. Certainly they do not take profit and costs into consideration as very often they produce at a loss.

One of the reasons for this bad economic management is the acceptance of the presence of "free riders" [12] among the employees: instead of trying to find a way to measure and increase their productivity, free riders are considered an unavoidable evil. Another cause of economic loss is the lack of dynamism in decision making procedures. Given that each operation must obtain the approval of a hierarchical organization, the mass of documents required is so huge as to hinder the successful economic working of each initiative. Looking at this example of "institutional" firm one might be inclined to think it represents a good theoretical justification for economic failures.

5. *Public Services: Solutions*

The public tertiary in all European countries produces too many services. If it is necessary to have a national defence since otherwise anyone, sufficiently rich, could have his own private army; if it is indispensable to have a common justice, otherwise there would be as many courts as there are contenders; if it is fair, that also the weakest part of the population gets education, medical care and social security at an accessible price; if it is socially right that people with lower incomes or pensions can travel, have housing, telephone, postal services and other services at reduced rates, rents, subscriptions, stamps and so on, still there is no reason for leaving in the hands of State bureaucrats the management of all these activities, apart from defence, justice, taxation.

In reality and again in Italy, the State, alias the parliament and gov-

[11] DENTE (1990, p. 20 etc.); the author considers these transactions as ambiguous and conflictual.

[12] MOE (1984, pp. 45-7 of the Italian ed. by Brosio).

ernment, look only for political consent and do not care for the people's well-being. The bureaucrats they employ to realize their policies often lack the necessary economic knowledge as would enable them to operate with competence. They are in fact not "naturally selected" by the market [13] like the entrepreneurs of private firms but politically appointed or chosen through public competitions rules by juridical [14] not economic requirements. And they allow themselves to disregard economic calculations, the budgets on which they work being planned for authorizing expenses not for controlling them [15]. On top of all this, the Italian legislation permits them to operate as monopolists, as said before, and grants them and their subordinates employment security and impossibility of dismissal.

It must be reported that in Italy since December 1992 things have started to change. A law is now under discussion in Parliament: this law belongs to a wider design of institutional reforms concerning the fields of national health and local finance. It is in line with the process of denationalization initiated by the present government and it concerns various aspects of the public administration. First of all, public managers with the exception of top judges and university, police, diplomacy employees will be considered "economically" responsible for their decisions and no longer covered by political warrant. They will be entitled to change their working time with a previous agreement with trade unions. As to labour mobility and salaries of all public employees they will vary according to local necessities and personal duties.

These measures, to be adopted as soon as the Parliament will give its approval [16], represent, for the Italian public tertiary sector, a sort of revolution. For this reason it is easy to understand the negative reactions they caused among public employees and trade unionists. Once again the general trade unions (CGIL, CISL, UIL), defending the interests of all workers, do agree with the government project, while specific organizations (UNICOBAS), representing only the public sector, complain against the government and the other (general) trade unions.

A confirmation that a revolution of the public sector is underway comes from another measure due to be taken when all articles of the law will pass. Still in May 1992, when this paper was written, we wrote that to think of eliminating all the distorsions of the sector without denationalizing public services, changing the law and providing economic training for public

[13] *Idem*, p. 64 of the Italian ed. by Brosio.

[14] DENTE (1991, p. 355); PETRETTO (1990, pp. 38-9).

[15] DENTE (1990, p. 23).

[16] This law was partially passed on January 23, 1993.

employees, seems utopia. A market, free to compete nationally and internationally, and a higher level of education for people working in the public tertiary sector (and particularly in Public Finance) [17], like that provided by French and English or Japanese [18] schools, are considered indispensable to keep public services working in Italy. In these days the government has promised to provide schools of public administration, at university level, for high rank staff, while we are waiting for the first denationalization of public institutions and firms. State is moving toward market not only in Eastern Europe!

6. *Private Services: Problems*

To have a private tertiary sector does not necessarily mean to be provided with efficient and efficacious services [19] because also in this sector many problems are still to be solved. Certainly private services, being produced according to market rules, benefit from market information through prices, and, being subject to competition, try to work productively. Still private services hardly satisfy consumers' demands (efficacy) and seldom work productively (efficiency).

First of all it is interesting to introduce the new term "servuction" invented by Pierre Eiglier and Eric Langeard (1987) to mean production of services. In this process, differently from what happens in the production of goods, the role of customers, who are at the same time consumers and producers of services, is very important. This is so evident in the case of self-services that it is possible to speak of "prosumer" [20]. Another very relevant aspect of servuction is the behaviour of people directly offering the services to customers or staff-in-direct-contact with consumers. This rapport is so meaningful that Normann [21] says that servuction is characterized by "personality intensity" as compared with "capital intensity" in industrial production. But in the generality of situations, customers take part in servuction through their comments and claims; actually, the more "active" they are in noticing bad or good aspects of services, the more "prosumers" they become.

Instead, the element that is shared by services and industry is the

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[17] Dente (1991, p. 355); Visco (1990, pp. 199-219).
[18] Pellanda (1992, p. 3).
[19] Bondonio (1990, pp. 44-49).
[20] Toffler (1980).
[21] Normann (1984).

incidence of physical support or capital which appears more and more determinant as more services become automatized (for example bank outdoor counter services). This is another way to point out the complementarity between labour and capital. Still it is labour the typical and scarce resource in services and the problem of how to measure its productivity arises again. In the private sector, as opposed to the public one, a help to know, if not to measure, labour productivity comes from consumers who can appreciate or criticize services and thus offer a kind of reference. For instance, when they appreciate the services of a hotel they go back to it and show the so-called "fidelity of consumers"; if they have something to complain about they change hotel and, in so doing, they encourage competition among hotels. But a precise quantification of labour exerted in services is impossible given two main difficulties: first of all, customers' judgements are very subjective, relative and changeable [22]; secondly, it is very hard for consumers to judge the value of labour developed in some liberal professions such as by lawyers, physicians and so on. The new "theory of the agency" [23] focuses this problem trying to solve it with the contract a "principal" (consumer) stipulates with an "agent" (producer of services) delegating decisions and competence to him. This theory ought to help also on the distribution side of the matter, as a principal pays a good agent more than a bad one. But all this has never been demonstrated nor confirmed by a large enough number of reported cases.

What is instead very frequent in the reality of the private tertiary, is the circumstance that if labour becomes too expensive, machine will substitute it in all possible situations, especially when services can be largely automatized. This substitution not only reflects the decision of entrepreneurs to follow the logic of an isoquantic production function, but also the legal context in which it can happen. At least in Italy it is possible to dismiss people on "justifiable grounds" [24] and economic difficulties of private firms are a reasonable motive for dismissing people at all levels, from managers to workers, individually or collectively.

Given the impossibility of measuring labour, as pointed out in Sections 2 and 5, the danger of fiscal evasion derives as a practical consequence. In the private sector it is very hard for the Ministry of Finance to check whether people pay the right taxes, as their incomes are neither known nor quantifiable with certainty. On the other hand, this enables people working

[22] Cercola (1990, p. 22 etc.; p. 184 etc.).
[23] Harris, Raviv (1976); Tirole (1986).
[24] *Italian Civil Code*, art. 2119.

in the private services to avoid paying the right taxes on their income due to the well known difficulty in levying a fair taxation on an unknown, concealed income.

Another problem to be considered in relation to private services is a kind of entrepreneurial mentality which, at least in Italy, has recently been dominating the sector. For instance, to be rather badly treated in a legal or a medical office or in a bank is a frequent experience. The impression on the part of customers is that the behaviour both of single professionists and large institutions is oriented to save time and to gain as much as possible. This is in line with the traditional theory of the firm which studies the comparison between revenues (gain) and costs (time) and we can conclude that from both an analytical and practical point of view the relevance of demand has been neglected. This happens in private as well as in public services, although for different reasons.

As mentioned above, public services – at least in Italy as long as things do not change – operate in a monopolistic regime and with no budget control; this leads to paying much less attention to the slope of the demand curve than what a private monopolist would do, and to have no fear of failure because the Italian political system, up to now, does not require its bureaucrats to produce economic results and allows them to waste public money. But the elasticity of demand for services is equally disregarded in the private tertiary sector. It is the lack of attention to marketing which seems responsible for this situation and which, both in theory and in practice, represents a problem for services. The theory of the firm gives indeed too little space to marketing and to demand analysis, while Italian consumers are more and more dissatisfied with the services they get. Thus many Italians are looking forward to the European integration of 1993 which will allow foreigners to operate in Italy and (hopefully) provide better services.

7. *Private Services: Solutions*

We will now consider some tentative solutions to the problems characterizing private services. If consumers are so important to represent, with their judgements and their payments, a kind of reference for measuring labour exerted in services, it is urgent to take them into more consideration. Their needs and expectations, if adequately satisfied by services, render the latter more efficacious. Given that services have a technical support in physical structures, a continuous search for functional improvement must be looked for. Still it is labour at all levels that is the most important factor of

"servuction" and it needs constant up-to-day training. Human labour, coupled with capital, make services efficient.

Both efficacy and efficiency belong to the item called "quality of services". In the 1970s the quality of services was not taken too much into consideration. Only in the 1980s control *of* the quality (in the sense of correspondence to given parameters), then *for* the quality (meaning continuous improvement), later on *of the total* quality (as conformity to necessities) [25] was undertaken. But it was under the influence of Japan, of its economic success and its social philosophy, that the Western countries started to study the so-called *global* quality which means to offer services trying to satisfy not only the material wants of people, but also their spiritual needs. In more technical terms, attention must be transferred from products supplied to processes through which they are supplied. This new way of "servuction" pays more attention to quality than to quantity and involves everybody from top managers to bottom employees.

This new approach, to which services, both private and public, ought to conform, compels firms to change: it requires more training to understand consumers' expectations and less concentration on costs, profit and sales [26]. It represents a new way of organizing services in daily life and implies the introduction of a larger number of components in Economics. The tertiary sector in Italy is, in many respects, dominated by a too conservative management and by a scarcely informed and involved staff [27]. In its turn, economic science pays more attention to the analytical tools of Political Economy than to elements of Business Administration. Services need training, Economics lacks marketing. Both must change to avoid failures and obsolescence.

What is required is a change of mentality on the part of managers and theorists. And not only for the production and the theory of services, but also for the solution of another typical difficulty of the sector: the fiscal problem. Unless people are convinced that to pay taxes is a social duty, they will try to avoid doing so. Unless they realize that private abuses are public damages, they will go on concealing income from their unmeasurable labour. But as long as men think in terms of their own material advantage, it is unlikely that they will mature a "global" approach to quality, not only of services, but of life itself.

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[25] CERCOLA (1990, p. 19 etc.).

[26] ZEITHAML, PARASURAMAN, BERRY (1990, ch. V).

[27] *Idem*, ch. VIII.

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IL SETTORE TERZIARIO PUBBLICO E PRIVATO IN ITALIA: PROBLEMI NOTI E POSSIBILI SOLUZIONI

Settore terziario significa servizi. I servizi sono difficili da classificare (perché eterogenei e immateriali) e da quantificare (perché, basati sul lavoro umano, vengono altamente complementati dal capitale tecnico).

I servizi in Italia sono pubblici e privati. I primi, nati per motivi d'equità, risultano tragicamente inefficienti causa procedure burocratiche e prerogative legislative. La loro privatizzazione insieme a cambiamenti legislativi favorevoli alla concorrenza e a scuole per amministratori pubblici sono i rimedi da adottare. Una legge del 23 gennaio 1993 è in linea con questo lavoro scritto nella primavera del 1992.

I servizi privati sono visti alla luce delle teorie della « servuzione », « agenzia » e « consumatore/produttore ». Tuttavia l'insufficiente attenzione, sia teorica che pratica, dedicata in Italia alla domanda dei consumatori, all'innovazione del capitale tecnico, alla mentalità imprenditoriale, indica che anche nel terziario privato molti sono i problemi ancora da risolvere.

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GROUP EFFECTS IN REGRESSION MODELS

by
STEVEN B. CAUDILL *

Introduction

Most data in economics fall naturally into groups. For example a sample of individuals can be grouped by state, SMSA, or country of residence. The pooling of time-series and cross-section data creates two possible groupings; observations can be grouped by time period, or they can be grouped across time periods by state, SMSA, or country of residence. Data that vary only at the group level are frequently included as regressors in regression models.

To see how popular this practice has become, one need only examine recent volumes of any economic journal containing empirical research. In a study on marriage and divorce appearing in the *American Economic Review*, Peters (1986) uses a national sample of individuals, and includes variables on the state divorce rate and the state percent Catholic as regressors. In a study on Canadian migration published in the *Journal of Political Economy*, Shaw (1986) estimates regression models in which the unit of observation is the Census Metropolitan Area (CMA). Some of the models Shaw estimates include province-level variables such as the ratio of the number of weeks of paid unemployment insurance in a province to the number of weeks of unemployed labor in the province. Each CMA in a province is assigned the same value of this ratio. In a study on the incidence of co-authorship appearing in the *Review of Economics and Statistics*, Barnett, Ault and Kaserman (1988) estimate a model with a pooled time-series and cross-section data set. The dependent variable is the number of authors of papers

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published in the *AER* from 1960 through 1985. One of the regressors in their model is the number of submissions to the *AER* in each year, and this does not vary across observations in a particular year. In the *Southern Economic Journal*, Shaw (1987) estimates models using data from the *National Longitudinal Survey of Young Men*, and includes a measure of the area unemployment. In an article appearing in the same volume, Roback (1987) estimates models using the 1973 four percent Census of Colombia, and includes the area unemployment rate as a regressor. Clearly the practice is quite common.

The purpose of this paper is to examine the properties of econometric models which include group variables as regressors, and to compare these models to econometric models that instead use group dummy variables as regressors. Any researcher who uses group variables can also use group dummies.

If the group information is included in the regression model only to satisfy *ceteris paribus* conditions, then group dummy variables should be included instead of group variables. The dummy variables explain at least as much variation as the group regressors. Additionally, if dummy variables are used, the possibility of omitting relevant group variables is eliminated.

The situation is somewhat different if the group variables are included to estimate parameters of interest. Then, the dummy variable model is not an option. The danger of omitting relevant explanatory group variables remains a problem, but a statistical test can be used to determine the severity of the problem.

The next section of this paper demonstrates that if the dummy variable model is estimated when the group variable model is correct, the explanatory power of the dummy variable model is equal to the explanatory power of the model using group variables as regressors. The estimates of coefficients of non-grouped variables are the same with either model; and if each group variable is multiplied by its coefficient and the result is summed across groups, the sum equals the dummy variable coefficient. The second section also shows that if the group variable version is estimated when the dummy variable version is correct, there may be omitted variable problems. The third section provides a discussion of the implications of the second section for empirical research, and it provides a statistical test to help determine when the use of group variables as regressors is ill-advised. The fourth section illustrates the implications of these results by applying what has been learned to the study on co-authorship by Barnett, Ault and Kaserman.

Demonstration

Three results are proven in this section. First, if the dummy variable version of a model is estimated when the group variable version of the model is correct, there is no loss of information in the estimation. Estimates of the coefficients of non-grouped variables are the same as those obtained from the group variable version of the model. Each dummy variable coefficient for a particular group is equal to the sum of each group variable times its estimated coefficient for a particular group. Second, if the group variable version of a model is estimated when the dummy variable version is correct, there may be a problem with omitted variable bias. Finally, if the group variable model is estimated when the dummy variable model is correct, the explanatory power of the group variable model is less than that of the dummy variable model unless the number of included group variables is equal to the number of groups.

The model containing a full set of group dummy variables can be written

$$y = X\beta + D\Theta + \varepsilon \tag{1}$$

where y is an $n \times 1$ vector of values of the dependent variable, n is the number of observations, X is an $n \times k$ matrix of independent variables without a column of ones, D is an $n \times s$ matrix of dummy variables where s is the number of groups, ε is a random disturbance vector, and β and Θ are $k \times 1$ and $s \times 1$ vectors of unknown parameters. Estimation by OLS yields

$$\hat{\beta} = H^{-1}X'y - H^{-1}X'D(D'D)^{-1}D'y \tag{2}$$

$$\hat{\Theta} = -(D'D)^{-1}D'XH^{-1}X'y + (D'D)^{-1}D'y + \\ + (D'D)^{-1}D'XH^{-1}X'D(D'D)^{-1}D'y$$

where $H = (X'X - X'D(D'D)^{-1}D'X)$.

The model including group variables can be written

$$y = X\beta + (DG)\Gamma + \mu \tag{3}$$

where, y, X, β, and D are previously defined. G is an $s \times r$ matrix of constants, $r \leq s$, which transforms the matrix of dummy variables, D, into a matrix of group variables, Γ is an $r \times 1$ vector of coefficients for the group variables, and μ is a random disturbance vector. If $R = G'D'DG$

and $S = (X'X - X'DGR^{-1}G'D'X)$, estimation of the group variable model by OLS yields

$$\tilde{\beta} = S^{-1}X'y - S^{-1}X'DGR^{-1}G'D'y \tag{4}$$

$$\tilde{\Gamma} = -R^{-1}G'D'XS^{-1}X'y + R^{-1}G'D'y + \\ + R^{-1}G'D'XS^{-1}X'DGR^{-1}G'D'y$$

Equations (1) and (3) represent competing formulations of a model. Any researcher who uses group variables also has the option of using group dummy variables. Next the implications of estimating one formulation when the other is correct are determined.

If the model including the dummy variables, (1), is estimated when the model containing the group variables, (3), is correct, it is easily shown that

$$G\tilde{\Gamma} = \tilde{\Theta} \qquad \tilde{\beta} = \hat{\beta} \tag{5}$$

This result follows immediately once it is realized that estimating (1) when (3) is correct simply amounts to a reorganization of terms in (3). The model estimated by OLS is

$$y = X\beta + D(G\Gamma) + \mu \tag{6}$$

The estimators for β and $G\Gamma$ are exactly the same as those given in (2). Even if the dummy variable model is estimated when the group variable formulation is correct, the estimator for β is the same unbiased estimator that results from estimating the dummy variable formulation. $G\tilde{\Gamma}$ is also an unbiased estimator of Θ. The sum of each group variable multiplied by the associated group coefficient yields the dummy variable coefficient for that group. This is an intuitive result. Each individual in a group is assigned one value, regardless of how many group variables are included. If all group information is included in one value, the best value to assign is the coefficient of the dummy variable for the particular group.

There are more severe problems if the group variable formulation is estimated when the dummy variable formulation is correct. If (3) is estimated when (1) is correct, the expected values of $\tilde{\beta}$ and $\tilde{\Gamma}$ are given by

$$E(\tilde{\beta}) = \beta + S^{-1}X'D\Theta - S^{-1}X'DGR^{-1}G'D'D\Theta \tag{7}$$

$$E(\tilde{\Gamma}) = [R^{-1}G'D'D - R^{-1}G'D'XS^{-1}X'D + \\ + R^{-1}G'D'XS^{-1}X'DGR^{-1}G'D'D]\Theta$$

As is the case when omitted variables are a problem, the estimators are biased and inconsistent unless the omitted variables are uncorrelated with the included variables [1]. The bias also disappears if G is of full rank, that is if there are as many group variables in the model as there are groups [2]. Then, there are no omitted group effects, G is of full rank, $R^{-1} = G^{-1}(D'D)^{-1}G'^{-1}$, and the expressions above simplify to

$$E(\tilde{\beta}) = \beta \tag{8}$$

$$E(\tilde{\Gamma}) = G^{-1}\Theta$$

There is an additional consequence of estimating the group variable formulation when the dummy variable formulation is correct – the R^2 of the model must be less than or equal to the R^2 of the model including a full set of dummy variables. The equality holds only if the number of group variables included in the model is equal to the number of groups.

This result can be established by comparing the sums of squared residuals for the two formulations, since the total sum of squares is the same for each. For the model including a full set of dummy variables, the matrix of explanatory variables is $Z = [X\ D]$, and the sum of squared errors is given by

$$SSE_d = y'M_d y \tag{9}$$

where $M_d = I_n - Z(Z'Z)^{-1}Z'$. A result due to Amemiya (1985, p. 461) allows $Z(Z'Z)^{-1}Z'$ to be written,

$$Z(Z'Z)^{-1}Z' = X(X'X)^{-1}X' + M_x D(D'M_x D)^{-1}D'M_x \tag{10}$$

where $M_x = I_n - X(X'X)^{-1}X'$. Thus SSE_d can be written

$$SSE_d = y'[I_n - X(X'X)^{-1}X' - M_x D(D'M_x D)^{-1}D'M_x]y \tag{11}$$

For the model including the group variables, the matrix of explanatory variables is $R = [X\ DG]$. The sum of squared errors for this model is given by

$$SSE_g = y'M_g y \tag{12}$$

where $M_g = I_n - R(R'R)^{-1}R'$. Once again applying Amemiya's result,

[1] See MADDALA (1977, pp. 156), for a discussion of the problems caused by omitting variables.

[2] In two papers, MOULTON (1986) and MOULTON (1987), the problem of correlation caused by not accounting for group effects is addressed.

$$R(R'R)^{-1}R' = X(X'X)^{-1}X' + M_x DG(G'D'M_x DG)^{-1}G'D'M_x \quad (13)$$

The sum of squared residuals for the group variable model can be written as

$$SSE_g = y'[I_n - X(X'X)^{-1}X' - M_x DG(G'D'M_x DG)^{-1}G'D'M_x]y \quad (14)$$

The difference between the sums of squared residuals is

$$SSE_g - SSE_d = y'[M_x D(D'M_x D)^{-1}D'M_x - M_x DG(G'D'M_x DG)^{-1}G'D'M_x]y \quad (15)$$

The matrix in this quadratic form is idempotent and therefore the quadratic form is positive semidefinite. This impies that

$$SEE_g - SSE_d \geqq 0 \quad (16)$$

This result proves that the R^2 of the model including group variables as regressors can be no larger than the R^2 of the model containing a full set of dummy variables. If the matrix G is of full rank, that is there are as many group variables as groups, the R^2's of the models are equal. This is true because if G is of full rank,

$$(G'DM_x DG)^{-1} = G^{-1}(D'M_x D)^{-1}G'^{-1} \quad (17)$$

and the quadratic form in (14) collapses to a zero matrix. A model containing a full set of group dummy variables has a higher R^2 than a model containing group regressors, and the model containing group variables can only do as well as the dummy variable model if the number of group variables included is equal to the number of groups.

Implications

The implications of the previous section for empirical research can be neatly broken down into four cases. The model including group regressors is either properly specified, or there are omitted group effects. Each of these cases is examined by assuming that the group variables are included either to satisfy *ceteris paribus* assumptions, or to estimate parameters of interest.

Suppose that the model given in (3) is correct, so the model including the group variables is properly specified. Also, suppose that the group variables are included to satisfy *ceteris paribus* assumptions. Then estimation

with group variables and estimation with group dummies yields the same result. The estimates of the parameters of interest, β, are the same, as are the R^2's of the models. If the number of group variables included in the model is smaller than the number of groups, estimation of the group variable formulation does save degrees of freedom. The consequence is that the standard errors of the parameters of interest are smaller than those obtained by estimating the dummy variable formulation. However, this gain is usually quite small since data sets in which group effects are estimated are usually very large. Thus the results of the two models are identical except for a loss of degrees of freedom if the dummy variable formulation is estimated, the consequences of which are usually negligible.

Suppose that the group variables are included to satisfy *ceteris paribus*, but some group effects are omitted. Not only is the explanatory power of the group regressor model less than the explanatory power of the dummy variable model, there are other problems as well. Omitting group effects leads to biased and inefficient estimation of the parameters of interest if the omitted variables are correlated with the included ones. Even if the omitted variables are not correlated with the included variables, their omission leads to inflated standard error estimates for those variables, and the tests of significance are too conservative. The seriousness of these problems provides sufficient justification to estimate the dummy variable model instead.

The implications from the analysis above are clear. The dummy variable model can do no worse than the group variable model, and it can do better. The R^2 of the dummy variable model is at least as large as the R^2 of the group variable model. Estimation of the dummy variable model avoids the potential problem of omitted variable bias in the estimation of the parameters of interest. Therefore, when group variables are included solely to satisfy *ceteris paribus* assumptions, group dummy variables instead of group variables should be included in the regression model.

The problem is not so easy to solve if the coefficients of the group variables are the parameters of interest. Estimation of the dummy variable model is no longer an option. Once more, there are two cases to consider. The first is based on the assumption that the group variable specification is correct, and the second is based on the assumption that there are omitted group effects.

If the group variable model is correctly specified, the choice is simple. The group variable model and the dummy variable model give the same results, but the dummy variable model does not permit the estimation of group parameters of interest, and is therefore not an option. However, researchers usually do not know if their models are properly specified. If the

group variable regression has been misspecified, omitted variable bias may result.

When the coefficients of the group variables are the parameters of interest, the dummy variable model is not an option, and a statistical test for the presence of omitted group effects is required. Such a test is easy to implement once it is recognized that the group variable model, (3), is a constrained version of the dummy variable model, (1). Recall that if the model contains as many group variables as there are groups, the result is the same as if the dummy variable model had been estimated. The implication is that if the model of interest contains r group variables, at most $s - r$ dummy variables can also be included. These variables together span the dummy variable space. Thus, the group variable model is a constrained version of the dummy variable model, with zero restrictions on the coefficients of some dummy variables. The presence of omitted group effects can be tested by including $s - r$ dummy variables in the group variable model, and then jointly testing the significance of the dummy variable coefficients using the F-test for linear restrictions [3]. The test statistic is

$$\frac{(SSE_g - SSE_d)/(s-r)}{(SSE_d)/(n-k-s)} \sim F_{s-r,\,n-k-s} \tag{18}$$

where SSE_g, SSE_d, n, k, s and r are as previously defined. The null hypothesis is that there are no omitted group effects, and the alternative hypothesis is that there are omitted group effects. If the null hypothesis is accepted, the group variable model can be used to make inferences on parameters of group variables. If the null hypothesis is rejected, the problems arising from omitted group effects are serious, and inferences based on parameters in the model should be viewed with suspicion. The solution to this problem is simple. The omitted group effects can be included by estimating the group variable model with the s-r dummy variables added. This hybrid model permits estimation of group parameters of interest, and controls for other group effects.

An Application

To demonstrate the propositions outlined in the previous sections of this paper, the model of co-authorship estimated by Barnett, Ault, and Kaserman (BAK) (1988) is re-estimated and compared to the dummy variable version of their model. The hybrid model suggested in the previous

[3] This test is similar to the RESET family of tests, RAMSEY (1969). Here the test variables are the group dummy variables.

section is also estimated. BAK used pooled time-series and cross-section data to estimate the relationship between the number of co-authors and several regressors. One of the regressors, SUB, is the number of submissions to the *AER* in a given year. This variable takes on the same value for every article in a particular 'group', in this case the group is a year. The BAK model is re-estimated along with a model that includes a dummy variable for each year.

The results of this estimation are presented in Table 1 [4]. As expected, the R^2 of the dummy variable version of the model is .0533 which is over 60% larger than the R^2 of the model BAK estimate. Also, the MSE of the dummy variable model is lower than the MSE of the BAK model, so the loss of degrees of freedom is not a serious problem.

In the case of the BAK model, the coefficient of the group variable, SUB, is a parameter of interest. The coefficient of SUB is necessary to permit testing of BAK's diversification hypothesis. Thus, the dummy variable model is not an option. Since the group variable version must be estimated, it is important to be certain that there are no omitted "year" effects.

In order to make that assessment, the BAK model is tested against the hybrid. The test statistic, $F = 2.2$, exceeds the critical value of F at the $\alpha = .01$ level of significance, suggesting that there are omitted group effects. However, since the hybrid formulation accounts for all group effects, the results of the hybrid estimation can be compared to the group variable model to determine how large an effect the omitted group variables had on the estimates of parameters in the BAK model. The results of the two models are very similar. None of BAK's hypotheses can be disputed. However, the results of the statistical test indicate the presence of omitted group effects. BAK did not test for the existence of these effects. Fortunately, when the effects are controlled, BAK's hypotheses are confirmed.

Conclusions

Often in applied econometric research, economists estimate regression models based on samples that include regressors which only vary from group to group. If the group information is included to satisfy *ceteris paribus* assumptions, the dummy variables should be used instead of group variables. The explanatory power of the dummy variable model is at least as

[4] In the discussion in the text, the models did not have intercept terms. In the table, the intercept is estimated and one group dummy variable is omitted.

TABLE 1

REGRESSION RESULTS

Variable	BAK Model		Dummy Variables		Hybrid	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio	Coefficient	*T*-ratio
NOTE	− 0.0794	− 3.059	− 0.0839	− 3.232	− 0.0839	− 3.232
EMP	0.1371	4.828	0.1522	5.329	0.1522	5.329
TE	0.1109	3.379	0.1053	3.212	0.0153	3.212
ACK	− 0.0093	− 2.447	− 0.0117	− 3.087	− 0.0117	− 3.087
LEAD	0.0766	1.315	0.0819	1.411	0.0819	1.411
SUB	0.0004	6.478	–	–	0.0005	3.696
INTERCEPT	1.0675	20.868	1.1714	13.792	1.0245	8.563
YR1	–	–	0.0859	0.736	0.0705	0.617
YR2	–	–	− 0.0487	− 0.410	− 0.0471	− 0.396
YR3	–	–	0.1265	1.071	0.0983	0.864
YR4	–	–	0.0649	0.595	− 0.0177	− 0.184
YR5	–	–	0.0752	0.686	− 0.0014	− 0.015
YR6	–	–	0.0202	0.184	− 0.0730	− 0.767
YR7	–	–	0.0508	0.474	− 0.0865	− 0.994
YR8	–	–	0.1190	1.172	− 0.0732	− 0.980
YR9	–	–	0.0851	0.864	− 0.1716	− 2.539
YR10	–	–	0.1149	1.176	− 0.2061	− 3.013
YR11	–	–	0.1661	1.691	− 0.1198	− 1.771
YR12	–	–	0.1596	1.668	− 0.7359	− 1.148
YR13	–	–	0.2270	2.291	− 0.0196	− 0.433
YR14	–	–	0.2114	2.162	− 0.0266	− 0.396
YR15	–	–	0.1764	1.789	− 0.0717	− 1.049
YR16	–	–	0.2327	2.375	0.0096	0.141
YR17	–	–	0.2158	2.185	− 0.0047	− 0.068
YR18	–	–	0.2712	2.731	0.0726	1.021
YR19	–	–	0.1946	1.985	− 0.0413	− 0.614
YR20	–	–	0.3498	3.605	0.1555	2.279
YR21	–	–	0.2751	2.791	0.0046	0.068
YR22	–	–	0.3198	3.269	0.0301	0.452
YR23	–	–	0.2681	2.750	− 0.0812	− 1.168
YR24	–	–	0.4286	4.437	0.0852	1.264
YR25	–	–	0.3599	3.696	–	–
R^2	.0331		.0533		0.0533	
MSE	0.3136		0.3100		0.3100	

great as the explanatory power of the group variable model. Also the potential biases due to omitted group effects are avoided. If the coefficients of the group variables are parameters of interest, the dummy variable model is not

an option. The group variable model must be estimated, but omitted variable bias is a possibility. In order to make certain the omitted group effects are not a problem, use of the statistical test proposed here is suggested. If the null hypothesis (no omitted group effects) is accepted, then inferences can safely be based on the coefficients of the model. If the null hypothesis is rejected, the researcher can not test the hypotheses with the model estimated, and should include additional dummy variables to account for omitted group effects.

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EFFETTI DI GRUPPO IN MODELLI DI REGRESSIONE

Lo scopo di questo articolo è di esaminare le proprietà dei modelli econometrici che includono variabili di gruppo come regressori e confrontarli con quelli

che invece usano come regressori variabili dummy di gruppo. Ogni studioso che usa variabili di gruppo potrebbe anche usare dummy di gruppo. Se l'informazione sul gruppo viene inclusa nel modello di regressione soltanto per soddisfare condizioni *ceteris paribus*, allora si dovrebbero includere variabili dummy di gruppo anziché variabili di gruppo. Le variabili dummy spiegano per lo meno altrettanta variazione quanto i regressori di gruppo.

Inoltre, se si usano variabili dummy viene eliminata la possibilità di omettere importanti variabili di gruppo. La situazione è un poco diversa se le variabili di gruppo sono incluse per stimare parametri importanti. Allora il modello con variabili dummy non è adatto. Il pericolo di omettere rilevanti variabili di gruppo esplicative rimane un problema, ma si può usare un test statistico per determinare la gravità del problema.

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A FORECASTING MODEL FOR OIL-RESERVE: A CASE STUDY OF THE UK-NORTH SEA

by
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Introduction

In view of the recent international developments in the Middle East there is a revival of interests on the effect of oil prices on the supply, extraction and discovery process of oil fields (Pesaran, 1990). Although recent literatures have incorporated both economic and engineering approaches, we have not seen any analysis regarding future discoveries of oil fields and their forecasting methods. The purpose of this paper is to incorporate economic, geological and engineering information in the analysis of forecasting future discoveries of oil fields and to apply the method for the specific case of the continental shelf of the UK's North Sea. (We restrict our analysis for discoveries in a particular area). According to export opinion world recoverable oil resources could be as high as 4.2×10^{12} barrels or as low as 1.35×10^{12} barrels (see Energy Technologies for the UK, Vol 1, HMSO; and UK oil and gas guide, Arthur Anderson). Using current technology we can extract about 35-45 percent of the available recoverable deposits of oil. In the case of the UK the present reserve of recoverable oil in the North Sea is about 1500 million tons. The whole of the North Sea has not yet been explored but from past experience we can formulate prediction for potential recoverable reserves. Regarding North Sea, studies of Odell and Rosing (1976) and Barouch and Kaufman (1976) provide examples of the kinds of forecasting models that can be developed with even minimum amount of data. The model developed below aims at taking into account the discovery process of an oil field, and incorporates the assessment of the possible risk of the explorer and the influence of different economic vari-

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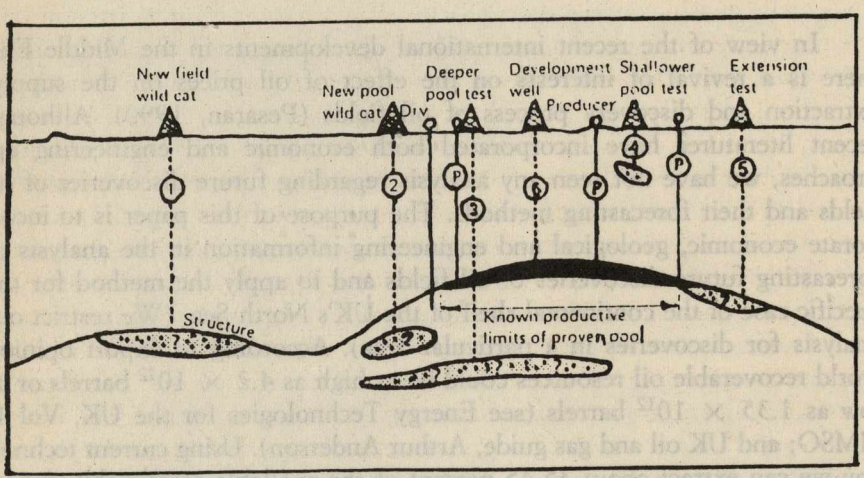
ables on the decision to explore. (Thus we are not considering the production and exploitation process).

The petroleum prospective areas of the world consist of sedimentary basins and geosynclines not too intensely deformed tectonically, including the continental shelves down to 200 metres depth. Certain oceanic areas beyond the continental shelves – continental slope – have petroleum prospects, but their eventual development may be delayed by 10-20 years. The major areas that should be considered for petroleum exploration appear to have already been outlined in the world. Yet the appraisal of the extent of these areas is very conservative, often underestimating what is revealed by subsequent exploratory work.

Certain concepts are important for our analysis. (See also Figure 1 for

FIGURE 1 Classification of wells by geologists



NOTE: Proved reserves are established by the producing wells (P). Unproved reserves in the field will require additional drilling by wells 3, 4, 5 and 6. Wildcat [random] exploratory drilling can find undiscovered resources in adjacent pools or in separate fields (1 and 2).

certain concepts regarding explorations). First, we have the initial oil in place (OIP) that, in the amount prior to any exploitation, is in undiscovered and discovered fields. Obviously, the OIP is difficult to estimate. As for the undiscovered (unknown) fields, an estimate has to be made based on the discovered (known) fields in relation to the geological setting.

This would not be too difficult if the unknown fields belonged to the same geological groups as the known fields, or if both known and unknown

fields belonged to a known statistical population. Perhaps the best one can hope for with respect to the OIP value is to establish lower bounds for it and to raise the lower bound whenever wider knowledge about the petroleum geology of the region considered justifies it. The second concept is that of recoverable resources; that is, the amount of oil which can be recovered within technological and economic limits from both undiscovered and discovered fields. This is often denoted as the estimated ultimate recovery (EUR). The relative amount of oil that is recoverable varies greatly. At the moment, a figure of 40 per cent probably represents a target figure for this phase of recovery (see Grossling, 1976). Third is the concept of proved reserves. Proved reserves, designated here as R_1, are defined as the amount of petroleum which can be extracted from explored acreage within present economic and technological limits. Then, we have the concept of expanded proved reserve (R_2) that represents the expected amounts of oil from revisions and extensions of discovered fields. We deal here with a different kind of uncertainty, the speculation that some petroleum may exist beyond the known parts of fields and as extensions of them. Grossling (1976) made the following generalisations. An additional quantity equal to the proved reserve can be obtained with a probability of 0.8 and another equal additional quantity with a probability of 0.5. Hence the expected value of the expanded proved reserve designated here as R_2 would be $1R_1 + 0.8R_1 + 0.5R_1 = 2.3R_1$. This appears too optimistic. This might have been true when Grossling made his studies, but with more refined values of today the function may no longer hold.

In our model the explorer would want to maximise his probabilistic net benefits arising out of success in exploration ventures, and hence would determine the optimum expenditures in explorations depending on the success year by year. With the optimum expenditures we work through the system we can derive the future numbers of oil fields to be discovered, their probabilities, the size distributions of the future discoveries and the total size of the discoveries. The net benefit function depends on particular assumptions regarding future prices of oil, rate of interest and rate of taxation, and the explorer's subjective assessments regarding risk (simply speaking, the discount rate). We will also try to see how changes in these assumptions can influence exploration decisions and the future discoveries of oil reserves.

1. – *A Discovery Process Model*

We can find search expenditure per square kilometre by dividing the

total search expenditure by the area (A_t) under operation in a particular period. Dividing the total search expenditure per square metre by the cost of exploratory drilling per metre, we get an approximation to the amount of exploratory drilling meterage per square kilometre area. We assume the amount of exploratory drilling meterage implies the depth of drilling at a particular site, although there may be other geological factors which we ignore for the sake of simplicity. The depth of drilling may imply the level of activity regarding exploration. In addition to drilling costs, there has to be a seismic survey.

The amount of exploratory drilling meterage implies the intensity of the process and the number of site locations under our assumptions. Given a site location, whether or not the location is drilled depends on the success ratio the searcher thinks there could be. The success ratio depends not only on the intensity of the search, but also on the growing geological knowledge about the hydrocarbon locations in the sedimentary rocks. The effects of depletion on the existing stock in the earth are also important. If the region is mature, then the effects of exhaustion cannot be neglected. On the other hand, the effect of increased geological knowledge on discoveries is probably greatest in the early stages of exploration and diminishes as the region matures. We accept here that the cumulative drilling meterage can be considered as a measure of the amount of accumulated knowledge and as a measure of the state of maturity and therefore exhaustion of the region. We therefore accept the following functional equation to determine the success ratio.

$$Z_t = a\, D_t \exp\left[\alpha - \beta\,(c_{t-1} - K)^2\right] \tag{1}$$

where

Z_t = success ratio in exploration in T
$$= \frac{\text{number of successful wells drilled in period } t}{\text{total number of wells drilled in period } t}$$
D_t = amount of exploratory drilling footage
c_t = cumulative exploratory drilling footage in the period $(t-1)$
a = a constant to be estimated

As c_{t-1} grows towards K, the success ratio rises, because of both the intensity of the process and growing geological knowledge; but with increasing discovery efforts the number of wells in that area is becoming exhausted. So when c_{t-1} exceeds K, the success ratio begins to fall as exhaustion effects begin to dominate. Early in an exploration programme, before

much knowledge has been accumulated, a unit increase in the drilling footage (D_t) leads to a smaller increase in Z_t than does a unit increase in D_t when c_{t-1} is near K. Once the critical point, K, is passed and exhaustion begins to dominate, unit increases in D_t lead to smaller and smaller increases in Z_t. So as c_{t-1} becomes larger, Z_t passes through a point of inflexion and asymptotically approaches zero. The success ratio actually determines the mean rate of the discovery. By mean rate, we mean the number of fields discovered in each year on average during the process of our calculation. (On average, drilling a well takes 2-3 months, so a well may have started last year, giving success this year. Thus, we have to take the average over two consecutive years within the period of consideration). We assume that the mean rate depends negative exponentially on the success rate. The reason is that the success ratio refers to a successful well, which may or may not lead to new fields in every case because even if the drill hits oil, the well could be proved very thin in hydrocarbon or could be just another extension of the old field already discovered, if the strikes are very close. So we have the following relationships:

$$\lambda_t = \alpha_1 \exp^{-\beta_t(Z_t)} + \mu_1 \tag{2}$$

where λ_t is the mean rate of the discovery of oil fields and μ is a normally distributed noise variable with $E(\mu_1) = 0$ and var $(\mu_1) = \Gamma_1^2$. This may be a simplified picture, but a number of authors have tried this type of function to explain the rate of discoveries (see Uhler, 1970; Barouch and Kaufman, 1976; Allais, 1957).

Once we can calculate Z_t, the probability of success in drilling, we can estimate the mean number of oil fields to be discovered in that period. The next question is to analyse how the amounts discovered in each field might be different over the period of an exploration programme. The mean size of discoveries in most cases tends to decline (Uhler, 1970). The usual way to incorporate the phenomenon is to fit a log normal curve with respect to the cumulative drilling footage, assuming the size per reservoir is a long normally distributed random variable. So we get:

$$\log (SZO_t/\lambda_t) = \log b_1 - \gamma_1 c_{t-1} + \mu_2 \tag{3}$$

where μ_2 is a random noise variable normally distributed with $E(\mu_2) = 0$ and var $(\mu_2) = \Gamma_2^2$, and SZO is the total size of the reservoir discovered and γ_1 is a parameter to be estimated. We can very easily derive the expected size of the reservoir discovered as

$$E(SZO_t/\lambda_t) = b_1 \exp(-\gamma_1 c_{t-1} + \Gamma_2^2/2) \tag{4}$$

Equation (3) gives the equation for the average size of the reservoir of oil, and Equation (4) gives the expected value of the average size of the discovery. Thus we get the total size of the reservoir discovered as:

$$E(SZO_t) = \Sigma E(SZO_t/\lambda_t)\, E(\lambda_t) \tag{5}$$

2. – *Estimation of the Discovery Process Model*

Most of the data needed to estimate the above model of this behaviour equation are obtained from a) detailed information provided by different oil companies and b) from the Energy Digest of the UK. The time series data set spans for the period between 1963 to 1988.

One more equation is added to the above set, for the area under operation. The area under operation is now about 60,000 square km. The area is found, empirically, to be related only to the changes in the price of oil and the success rate in the previous year (see D'Ancona, 1988 for further supports).

The estimation of the behaviour equations have been done by 2SLS (two stage least square) assuming first order autocorrelation of the disturbance; so the disturbances are generated according to the following scheme:

$$\varepsilon_t = p\varepsilon_{t-1} + \mu_t$$

when μ_t is a normally and independently distributed random variable with mean zero and variance Γ_μ^2 that is assumed to be independent of ε_{t-1}; that is $u_t = N(0, \sigma_u^2)$ for all t. We have also: $E(u_t, u_s) = 0$ for all $t \neq s$; $E(u_t \varepsilon_{t-1}) = 0$ for all t; $\varepsilon_t = N[0, \Gamma u (1-\rho^2)]$; cov $(\varepsilon_t \varepsilon_{t-1}) = \rho\sigma^2$ where var $(\varepsilon_t) = \sigma^2$.

The estimates of the stochastic equations are as follows (figures in brackets are the estimated t-statistics and ρ is the degree of autocorrelation present).

Area under operation

$$A_t = \underset{(2.07)}{34127.091} + \underset{(2.01)}{177.274}\,[PO_t/PO_{t-1}] + \underset{(1.87)}{12.531}\, Z_{t-1} - \mu_1 \tag{3.1}$$

$$n = 21, \quad R^{2,} = 0.76, \quad DW = 1.93, \quad \text{var}(\mu_1) = 1.92, \quad p = 0.32$$

Probability of success

$$Z_t = \underset{(1.37)}{1.110}\, D_t - \underset{(2.01)}{0.076} \exp\left[-\underset{(1.05)}{0.002}\,(c_{t-1} - \underset{(1.79)}{25.904})^2\right] + \mu_2 \qquad (3.2)$$

$$R^2 = 0.87, \quad DW = 1.23, \quad \text{var}\,(\mu_2) = 1.07, \quad p = 0.55$$

Mean rate of discoveries

$$\lambda_t = \underset{(3.07)}{2.044} \exp\left(-\underset{(1.74)}{0.676}\, Z_t\right) + \mu_3 \qquad (3.3)$$

$$R^2 = 0.79, \quad DW = 1.84, \quad \text{var}\,(\mu_3) = 2.5, \quad p = 0.04$$

Expected average size

$$\log\,(SZO_t/\lambda_t) = \underset{(1.39)}{1.805} - \underset{(1.87)}{0.006}\, c_{t-1} + \mu_4 \qquad (3.4)$$

$$R^2 = 0.76, \quad DW = 2.08, \quad \text{var}\,(\mu_4) = 1.48, \quad p = 0.21$$

Autocorrelation is present significantly in a number of equations except (3.3). The stochastic simulation carried out through the error terms have reduced the possible forecast errors of the equations. As the residuals have gone through several simulations, these are expected to be stable under possible sampling fluctuations.

3. – *Forecasting*

Our basic problem is to forecast the total size of the oil fields to be discovered. Because that depends on the exploration efforts, which in turn depends on the amount of expenditure on research procedure, the problem here is to determine what would be the size of the discoveries under a specific assumption regarding the future expenditures. For that purpose three alternative scenarios regarding future expenditure were assumed for the period between 1989 and 1999.

Other assumptions are that the rate of tax on the discovered reserves will be constant and the rate of discount will be 15 percent throughout the

TABLE 1

SCENARIO: PRICE OF CRUDE OIL (US $ barrel)

	Scenario 1	Scenario 2	Scenario 3
1989	18.0	18.5	18.0
90	18.5	19.5	18.0
91	19.0	20.5	17.5
92	19.0	21.5	17.0
93	19.5	22.5	17.0
94	19.5	23.0	16.5
95	20.0	23.5	16.5
96	20.0	24.5	17.0
97	20.5	25.0	17.0
98	21.0	26.0	17.5
99	21.0	26.5	18.0

period. In the standard scenario oil price will be either constant or will grow at a very insignificant rate (see Table 1), at constant 1989 prices. In scenario 2, an optimistic phase for the oil price is assumed, whereas in scenario 3 a pessimistic phase regarding oil price is assumed. It is essential to mention that these assumptions are not based on any particular type of mathematical expectation, but on author's own expectations regarding the future price of oil under alternative scenarios. The reference price for oil is that of Brent light crude in Rotterdam. For each of these three scenarios, from the solu-

TABLE 2

FUTURE EXPENDITURE ON SEARCH FOR OIL FIELDS (in 1988 prices)

(£ million)

Year	Scenario 1	Scenario 2	Scenario 3
1989	390.6	390.6	390.6
90	368.3	372.5	360.1
91	362.7	385.9	356.5
92	334.8	398.7	325.5
93	320.8	407.5	310.7
94	304.1	415.5	292.5
95	287.3	419.8	265.7
96	270.6	422.4	257.5
97	253.8	425.9	241.2
98	217.6	427.1	205.9
99	198.1	431.5	175.4

tion of the process the total size of the discovered oil revenue, the probability of success in drilling, the area which would be covered and future drilling metre per square km can be derived. The results show the discovery rates will fall over time unless oil price will go up (as in scenario 2). These demonstrate that the depressed oil price cannot provide enough incentives towards exploration in a field which is already on its declining path; however an optimistic scenario regarding oil price can change the picture dramatically, although the total sizes of discoveries will be low; in Table 3,

TABLE 3

SIZE OF FUTURE DISCOVERIES
UK Continental Shelf

(million tons)

Year	Scenario 1	Scenario 2	Scenario 3
1989	21	21	21
90	17	17	17
91	17	20	15
92	13	18	10
93	12	15	10
94	10	15	10
95	10	16	7
96	10	16	7
97	5	18	5
98	5	15	5
99	5	15	5

scenario 1 and 2 give insignificant discoveries beyond 1995; even scenario 2 does not improve the picture very much which implies the success rate in future will be very low. However to calculate the future stock of oil reserves one has to calculate the appreciation of the already discovered stock and the future stock. Appreciation occurs due to increased knowledge of the field as the extraction continues over the years. The appreciation factor varies between 40 and 60 percent, but it is quite probable that during the life time of a well it could appreciate by about 4 to 6 times.

Conclusion

The above model presents a forecasting process in which a rational investor searching for oil can decide how much to invest, given the uncer-

tain nature of the outcome and the depleting stocks of the reserve. A small econometric model was estimated and solved which shows the behaviour of several important variables such as rate of drilling, number of new discoveries, size of discoveries, drilling metre per square km etc. Because the model was estimated from the North Sea data, it represents realistic behaviour of the geological and economic systems. Considering the sensitivity of the results future price of oil is the most influential factor to determine further expenditures on search for oil.

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UN MODELLO PER LA PREVISIONE DELLE RISERVE PETROLIFERE: STUDIO PER IL MARE DEL NORD BRITANNICO

Il modello usato in questo articolo presenta un processo di previsione con il

quale un investitore razionale che fa della ricerca petrolifera può decidere quanto investire, data la natura incerta del risultato e la sempre piú scarsa quantità di riserve. Si stima e si risolve un piccolo modello econometrico che mostra il comportamento di molte variabili importanti come il saggio di perforazione, il numero di nuove scoperte, la loro dimensione, i metri di perforazione per metro quadrato ecc. Poiché il modello è stato stimato coi dati del Mare del Nord, esso rappresenta un comportamento realistico dei sistemi geologici ed economici. Considerando la sensibilità dei risultati, il prezzo futuro del petrolio è il fattore più importante per determinare ulteriori spese in ricerca petrolifera.

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AGRICULTURAL DEVELOPMENT AND REFORM IN THE COUNTRIES OF THE FORMER SOVIET UNION

by
ROBERT H. WESSEL *

In the last century, Russia was the largest grain exporter in the world. Although conditions have changed greatly since the Communist takeover seventy years ago, agriculture still plays a dominant role in its economy, accounting for at least 22 percent of its GNP and employing over 34 percent of its work force (*Economist*, April 11, 1992, p. 71). The decline of the former Soviet Union from world leadership in farming reflects both organizational faults and improper motivation. Since agriculture must play a leading role in the post-communist economies of Russia and Eastern Europe, it is essential to undertake an evaluation of what it has been and what it should be in the first non-communist years as well as a future likely to be dominated by biotechnology and genetic engineering.

Those in charge of the Soviet economy were always preoccupied with the economies of scale. This was particularly true in agriculture where 26,000 giant state-owned farms occupied over 97 percent of its available land space. So-called state farms averaged 17,000 hectares in area in 1980 while collective farms, also state-owned, usually encompassed about 6,500 hectares (Johnson and Brooks, 1983, p. 4). These large units typically had more than 500 workers per farm. In unsuccessfully seeking the economies of scale, they far outdistanced the large agribusiness units found in the U.S. today. The balance of pre-breakup Soviet farm units were small garden-type plots, usually operated by those employed on the large state or collective farms. About 38 million of these plots occupied a mere 3 percent of the land. Compared to the U.S., however, Soviet agriculture was labor-intensive rather than capital-intensive, employing five times as many laborers but only half as many tractors. The tractors used, however, were enormous, usually

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the size of a tank and thus are well adapted only to very large scale operations. By world rather than U.S. standards their agriculture and especially their grain production would be rated capital-intensive.

The old Soviet Union had about 232,426,000 hectares of crop land as opposed to 189,915,000 for the U.S. Employment which came to 91 per 1000 hectares against 17 in the U.S. produced 201 million metric tons of grains compared to 284 in the U.S. Over 14 percent of their labor force was directly employed in agriculture compared with 2.5 percent in the U.S. while in excess of one-third of their workers are involved in the production, processing and distribution of farm products in contrast to one-sixth in the U.S. In the 1986-89 period, 35 billion rubles were invested annually in agriculture in the Soviet Union (U.S.D.A., 1991).

The Output of Russian and Soviet Agriculture

Soviet and Russian agriculture is exceedingly inefficient producing far less per hectare than in other countries in comparable climate zones. They are relatively most efficient with wheat, their principle crops averaging in 1990 about 2 metric tons per hectare. This compares to 1.8 metric tons in Canada, 1.9 in Argentina, and 2.4 in the U.S.A. When weather conditions are factored out, their results are reasonably comparable to the output achieved in the U.S.

Weather adjusted yields of grain (mostly wheat) per hectare rose 4.5 percent from 1981-1989. This can largely be attributed to the adoption of "intensive" agro-technology in 1981 (U.S.D.A., 1990). This technique involved the application of a balanced mix of high-yielding seeds, water, fertilizer, and pesticides on a smaller acreage and allowing an increased area to lie fallow. The area so treated rose from 3.7 million hectares in 1981 to 43 million hectares in 1989 (Desai, 1992, p. 50). Previous increases in fertilizer and equipment had been more or less haphazard, producing a mere 1.5 percent annual gain from 1965 to 1980. In cereals the USSR lagged with 1.9 metric tons per hectare as opposed to 2.2 for Canada, 2.3 for Argentina, and 4.3 in the U.S. In other crops such as roots and tubers, potatoes and sugar beet, they were far behind. Skold and Popov found that in producing corn, minor crops and vegetables Soviet farmers were far less efficient than in raising wheat where they achieved 83 percent of the production possible with the land and capital available (Skold and Popov, 1990). They also trailed the U.S. and others in livestock yields in relation to feed applied. This is attributed to a serious deficiency of protein in livestock feed and was occasioned by a minimal output of soybeans which can easily be turned into meal with high protein content.

The Faults of Soviet Agriculture

Size. – We have noted that the Soviet preoccupation with the economies of scale led to uneconomically large state and collective farms. Experts on the other hand believe farms as small as 50 hectares are viable in the warmer and more fertile south. Although wheat, their principal crop, does well on larger areas, the huge size of farms in Russia runs far beyond what can be justified even with that crop. Russia's estimated grain crop for 1992 was estimated at 96 million metric ton down slightly from 97.1 in 1991.

Cooperation. – Along with dwindling supplies, farmer cooperation is becoming a problem. Many producers withheld supplies because of the relatively low price of $55 per metric ton which prevailed for much of 1992. A large amount of this output found its way into unofficial channels of distribution. It is clear that the command structure of the Russian government was not totally effective. This is especially true where regional and local governments exercised significant control. This led President Yeltsin to order 20 thousand troops into the fields in the fall of 1992 to insure that most of the harvest was brought in and distributed through approved channels.

Pricing. – Under the system of procurement bonuses formerly used in the Soviet Union, large bonuses frequently were paid to inefficient farms with high costs and small payments were made to lower cost, more efficient producers. Obviously, rewarding the inefficient and penalizing the more effective created reverse incentives. In addition, farm wages failed to provide sufficient rewards for extra effort or quality production. Furthermore, agricultural prices which were set by government bureaucrats provided no guidelines to farm managers in selecting products mixes, methods of operation or choosing the most effective use of investment funds. This method of operation was only viable when supported by the elaborate system of food subsidies used in the past. In 1990, 48 billion rubles were paid as subsidies to meat production, 31 billion for milk, 7.3 billion for grain and 4.4 billion for potatoes (IMF, 1991).

Contamination. – According to some estimates, 30 percent of the food in the former Soviet Union is contaminated by the improper selection and use of pesticides and fertilizers. Fertilizer use in kilograms per hectare in grain production increased over five fold from 8.9 kilograms in 1964 to 51 kilograms in 1980 (Desai, 1987, p. 241). The results were devastating where improper agents were used. Feshbach and Friendly estimate that 14,000 persons are being killed each year by pesticides alone and 700,000 are being made ill. Despite their toxic properties, most of the pesticides are ineffective and over a quarter of every harvest is lost to pests. Almost half

of the farm land in the former Soviet Union is threatened by erosion, 160 million hectares are saline and 25 million are water logged or swampy. In southern Russian Kalmykia since 1954 the desert has increased in size from 12,000 hectares to over 800,000 hectares and is growing by 40,000 hectares a year. Because of these factors, Feshbach and Friendly feel that it may take years before Russian farms can supply the population with adequate food and even longer before Russia can again become an international competitor (Feshbach and Friendly, 1992). Even if these estimates are exaggerated, there is no question that a serious problem exists and that the ultimate rehabilitation of the agricultural economy depends on successful solutions. Looking to the future, it will have to deal with the stresses that modern agricultural practices will place upon the environment and those likely to arise in the age of biotechnology.

Upstream Failures. – The inadequacies and errors of the suppliers of the Russian and Soviet food industries have crippled productivity. We have noted that because of the preoccupation with size, tractors and harvesters are excessively large and not adapted to farming on a reasonable scale and that improper pesticides have routinely been supplied. This can largely be attributed to lack of market guidance in the decision-making process. Because Russian agriculture is relatively capital-intensive by most standards, farmers must borrow in order to plant their crops. Unfortunately, the Russian banking system is not well developed. Consequently, the flow of funds to farmers at appropriate times is not assured and at times totally lacking. The possible role of foreign sources is likely to be important, especially while domestic suppliers are in the process of rehabilitation.

Downstream Failures. – It is estimated that 10 percent of Russian crops are lost by improper harvesting in the fields and on-the-scene experts believe thereafter 25-30 percent of all grain is lost through bad storage. Many Russian grain silos, for example, contain rotting grain and are infested with rats (*Economist*, April 11, 1992, p. 72). In addition, processing plants are outmoded or obsolete. At least 40 percent of the sausage factories in Russia are classified as "ready for demolition", while in the Ukraine, 75 percent of the sugar-processing plants were built before World War I and will have to be replaced soon. The state-owned trucking firms that haul crops are typically very inefficient and employ obsolete vehicles. Outdated processing equipment and techniques as well as shortages of packaging materials contribute to additional shortfalls. Many, if not most of these failures are the results of government controls and administered prices. For example, when prices are set very low, managers pay little attention to waste. Inadequate government allocations of investment funds also account for much of the

shortfall and dilapidation in processing and distribution (Barkema, 1991, p. 12).

Agriculture Labor Problems. – Serious problems also exist with the agricultural labor force. To participate in the world agricultural markets of the late 20th and early 21st centuries, Russia and the rest of the former Soviet Union will need young well-educated computer-literate workers. Biotechnology will greatly enhance new technical requirements. This need does not dove-tail at all well with the current makeup of the agricultural labor force. Unfortunately, the workers on many farms are old. This is particularly true of northern areas where over 40 percent of the farm population is composed of women over the age of 55. Most are not acutely interested in change. This will greatly inhibit the process of altering farming methods and the adoption of modern techniques to enhance productivity. Such a group also has demonstrated lack of interest if not outright opposition to changing the pattern of ownership of agricultural lands and the methods of farm management (Vickers and Yarrow, 1991).

Reform Measures and the Chance of Success

Under the perestroika program of Gorbachev, concerted attempts were made to resolve the problems of Soviet agriculture. In 1990, procurement prices were raised with the objective of stimulating production through enhanced farm profits. At about the same time, procurement bonuses were eliminated to stop rewarding inefficiency. These measures, however, fell far short of what was needed because the system of outmoded government controls, although partially dismantled, still was controlling most decisions. Even after a further round of price increases in 1991, prices still were significantly below those set on world markets. Finally, in January 1992, Boris Yeltsin announced the end of most price controls on food in Russia and a dramatic program of privatization.

The old state-owned farm system is being largely dismantled in Russia and replaced by a system of private property. Private ownership of land was made legal by acts of its parliament along with the right to pass it along to heirs. Restricted rights to sale were also granted. Under this program, farmers have voted on the way their state-owned farms would be disposed of. Those on half the farms elected either family farms units or to enter into farm associations where individuals would own and operate their fields but would share farm machinery. The latter was a compromise made necessary by the very large size of existing equipment. Over two-thirds of Russia's farm land was given to the farmers who worked the land and the ownership will ultimately be evidenced by formal deeds.

At the other extreme, 10 percent of the farms elected to continue with the old arrangement and to have the state continue to own and manage the firms. This approach appealed to many of the older farm operators. The other 40 percent chose to remain in large units which, however, were transformed into privately held cooperatives. They also elected provisions which later would enable these cooperatives to be subdivided into private family farms. The latter can best be viewed as a transitional arrangement (*Economist*, April 11, 1992).

Will this Restructuring Work? – It is too early to conclude that the drastic restructuring of agricultural production will succeed in greatly increasing output. By April 1992, there were 70,000 family farms where a year before there were virtually none and the transition from state ownership and control to private operation for the rest of the farm land was proceeding very rapidly. But less than a year of private control does not produce an adequate base for proper evaluation. Nevertheless, there are several factors which suggest that it will achieve its objective.

Success of the Private Gardens. – We have already noted that there had been about 38 million garden plots on 3 percent of the land operated by workers primarily employed on state farms. These plots have been highly productive for two reasons. First, since part of their produce is sold on free markets, there is a strong direct incentive to produce. Second, these gardens concentrate on high value crops such as livestock and vegetables where they account for 28 percent of the milk, 60 percent of the potatoes, 35 percent of the poultry and one-third of the meat. One can expect that the newly established private farms will change their product mix to emphasize these more valuable crops and that profit motivation will greatly enhance their incentives to produce.

The Glasnost and Perestroika Period. – Before the end of the Gorbachev period, the institution of the reform measures created opportunities for collective farms to sell grain in private or cooperative outlets or to convert it into livestock feed where returns were higher than from sales to state procurement agencies at artificially low official prices. The result was an increase in output. These reforms also made it possible to exercise more discretion in crop selection. This also enhanced production. In sum, these developments suggest that even before state ownership had ended, opportunities to follow capitalist incentives that enhance output existed (Desai, 1992, p. 50-51).

The Chinese Experience. – A drastic alteration in the organization of agriculture in China began in 1978. State procurement prices were raised 22 percent in 1979. In that same year, the movement from the collective

system to one based on individual household farming began. It was completed by 1983. The results were impressive. In the ten years following these reforms, gross farm output increased 138 percent (Koo, 1990). To aid the process, control over the distribution of land was given to local authorities who frequently encouraged private farming. Initially, ownership was conditional in that farmers were not given outright title to land but had to be satisfied with 15-year leases. This new system was known as the Contract Responsibility System or Household Responsibility System.

In the period from 1978 to 1984, according to line production function analysis, Lin found that over 45 percent of the growth can be explained by increases in inputs. Most important was fertilizer which accounted for 32 percent of the enhancement of growth. Increased capital accounted for another 11 percent. The household responsibility system according to this analysis contributed over 48 percent. Using a supply response function analysis, Lin determined that the price increase of agricultural products was responsible for 16 percent of the growth and the household responsibility system accounted for 47 percent. It is clear that both approaches place a high evaluation on the system of organization (Lin, 1992, p. 46-47).

Although the results in China suggest that similar results may be possible in Russia, that does not necessarily follow. Although not capital-intensive by American standards, Russian farming is far more capital-intensive than China's. China' farming is also much simpler and relies less on equipment and chemicals. In contrast, Russia's farm economy is much more dependent on the upstream and downstream linkages. Furthermore, despite the fact that agricultural prices have risen more in absolute terms in Russia than they did in China, relative prices have not. Nevertheless, the Russian farm sector is one of the most flexible parts of its economic system and most likely to adapt reasonably quickly. Consequently, even though a comparison with China does not provide direct parallels, it suggests that a similar though delayed reaction may well follow.

Overcoming Impediments to Rapid Modernization

Equipment Size. – We have already noted the very large size of Soviet tractors and other harvesting equipment. This is clearly a structural impediment confronting the development of modern market agriculture. Assuming the state-owned farms are divided into 20 to 30 hectare plots there will be more than ten million farms in the former Soviet Union. Yet even at this size, they would require the use of tractors and harvesters in their cultivation. The ten million tractors needed would not be available in the short

run but would take years to produce (Desai, 1992, p. 52). In the interim, heavy reliance on joint use plans for the large equipment would be needed or subdivision would have to be delayed. We have already noted that a sizeable portion of the farm population would opt for one of these alternatives. This problem could be partially offset by importation of smaller-sized equipment from Western Europe and the U.S. A preferred alternative would be for Russia to retain reasonably large farms rather than moving from the excessively large to the very small. This solution would seem to follow the U.S. experience more closely and better enable them to meet the future needs of biotechnology and genetic engineering.

Upstream, Downstream Problems. – We have already noted the inadequacy of institutions supplying farmers and distributing their produce. These institutions, which had been largely ignored for generations, received only 15 percent of the government's investment in agriculture for the last decade and now require capital infusions (Barkema, 1991, p. 72). Again, new technology may come to the rescue. A simple example deals with a small but important part of the problem. According to World Bank estimates, simple efficient grain silos could be built all over Russia for less than $250 million and over the entire former U.S.S.R. for less than half a billion dollars. Clearly, this type of thing must be done but will not happen overnight. Because of intermittent and untimely availability of goods, an inordinate amount of agricultural crops is hoarded either for speculative reasons or to ensure future consumption. Good upstream, downstream institutional arrangements would eliminate the motivation for such hoarding. Along this line, in August 1992, Boris Yeltsin established a grain reserve to avoid winter grain shortages. This will also reduce speculation in grain trading and improve distribution to cities and other areas where supplies are inadequate.

Worker Attitudes and Skills. – Not all agricultural labor is enthusiastic about a subdivision and modernization of Soviet farming. We mentioned earlier that a high proportion of these workers are elderly and that over 40 percent are women. Many of these people lack the strength and the desire to undertake the difficult job and the risk of operating a private farm. For example, the elderly milkmaids in the Voronezk area expressed no interest in owning their land (Ignatius, 1992, p. 1). A change in work tasks and the type of individuals performing them will be needed as Soviet agriculture is modernized. Almost 70 percent of the Soviet agricultural work force now does manual labor (U.S.D.A., 1991). Over time provision must be made for replacing these workers with others younger and more vigorous who will be more receptive to new forms of organization and methods of production. Another problem is former Communist bureaucrats who talk reform but

work to thward it, as well as collective farm directors who are often unwilling to help new private farmers. All these too must be replaced, which can take place only by attrition with the passage of long periods of time.

A considerable skepticism of the reform movement exists among agricultural workers. According to the Geonomics Institute, 58 percent of Russian farmers contend they have seen no evidence of reform programs. In the Ukraine, 42 percent reported the same observation and in Kazakhstan 27 percent. The Institute attributes much of this attitude to the absence of laws governing agriculture or the contradictions among the new laws that have been passed. Respondents to the Institute's survey indicated little faith in the steps government has taken toward reform and in the quality of officials. Over 29 percent said their governments were not competent, 50 percent said they were only partially competent and only 10 percent believed them to be completely competent. Obviously a change in these attitudes will be essential to satisfactory long-run performance. Unhappily, 77 percent felt the food situation was still becoming worse. Nevertheless, more than half support privatizing land (Geonomics Institute, 1992). Obviously public support must be sustained until real performances can be demonstrated.

Conclusion

Fundamental agriculture reforms are well underway in Russia and many other parts of the old Soviet Union. Many difficult structural changes, however, are only beginning to be implemented. This is particularly true of infrastructure development and building up-stream and down-stream supporting institutions. Although substantial foreign investments funds are needed, most of the important institutions are necessarily domestic and cannot be purchased from abroad. Some farm machinery and transportation equipment needed in the transition are exceptions. Food imports and humanitarian supplies will also be essential for years. It goes without saying that rapid progress must at the same time be made toward rapid macroeconomic stabilization.

Finally, biotechnology is opening new frontiers in agriculture all over the world. Farmers will be able to produce more crops at lower prices but probably on larger sized farms than in the past. Many new materials will almost certainly take their places among agricultural products. The development of many new agricultural pharmaceutical products may well cause the word to be spelled "pharms" with increasing frequency. These develop-

ments inevitably lie ahead. Consequently, as they are beginning restructuring, Russia and the other countries of the old Soviet Union should be preparing their adaptation to this major change (Stanley, 1991).

Eventually another type of cooperation is essential – the willingness of the West to accept Russian and other Soviet-made goods in the trading process. Here strong opposition is already building in both European community and the U.S. Many Japanese markets will also almost inevitably remain closed. Although certain Soviet exports will almost always be welcome, rare metals are prime examples, acceptance of the agricultural products is by no means assured. Neither the U.S. nor the EC can expect the former Soviet Union and Eastern Europe to enjoy the prosperity and growth needed for peaceful coexistence and still retain high trade barriers against these important goods. Fair and equitable treatment must ultimately be extended to a wide range of agricultural goods. Only in this way can the countries of the Soviet Union really become members of the broad community of nations. We have a vital stake in their success.

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SVILUPPO AGRICOLO E RIFORMA DELL'EX UNIONE SOVIETICA

L'agricoltura ha un'importanza vitale per i paesi dell'ex Unione Sovietica in quanto rappresenta il 22% del loro PIL e occupa un terzo della forza lavoro. Vi era tuttavia una estrema inefficienza nella coltivazione di tutti i prodotti tranne il frumento. Responsabili di questa situazione sono l'eccessiva dimensione delle unità agricole, la mancanza di cooperazione fra gli agricoltori, varie disfunzioni e l'inquinamento di vaste aree agricole.

Si sta ampiamente smantellando il vecchio sistema agricolo a proprietà statale che viene sostituito da un sistema di proprietà privata. All'inizio del 1992 vi erano 70.000 imprese agricole private e si sta rapidamente procedendo ad ulteriori privatizzazioni. L'esperienza fatta con piccoli appezzamenti di terra fa prevedere che la privatizzazione determinerà un aumento della produzione. I risultati ottenuti in Cina con il Contract Responsibility System confermano questa previsione.

Gli investimenti in infrastrutture sono pure di importanza vitale come lo sono i massicci programmi di addestramento dei futuri agricoltori alle tecniche moderne. Inoltre, si dovranno scegliere con accuratezza dimensioni agricole sufficientemente ampie per soddisfare le esigenze della biotecnologia e dell'ingegneria genetica.

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WAGE, PRICE AND EMPLOYMENT IN GREEK MANUFACTURING

by
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1. *Introduction*

Greek manufacturing sector should be one of the triggering mechanism of development in the country's target of convergence towards the European Community's average macroeconomic records. However, its past history shows that this might be a difficult task. Greek manufacturing continues to occupy a relatively small share of the gross domestic product and despite the investment incentives and the heavy protectionism failed to grow up considerably (for a detailed analysis see Giannitsis, 1983).

As we can see in Table 1, manufacturing output exhibits some spells of high growth (around 10%) up to 1973 but slowed down considerably therafter and turned even to negative growth rates during the periods 1981-83 and 1986-87. This resulted in relatively high manufacturing employment growth in the early sixties, early seventies and the 1976-79 period which however slowed down remarkably in the eighties. Real wages followed a slightly rising path in the fifties and sixties which slowed down in the period of dictatorship (1967-74). However in recent years, excluding the two years of peak rates of growth in 1975 and 1982, real wage growth fluctuates considerably, and negative growth signs appear more often than in the 1956-73 period. There are two other factors as well: the oil price which was shot up twice in the seventies and competitiveness which seems to fluctuate considerably in the years following the collapse of the fixed exchange rate system.

This paper attempts to provide some reflections on the determinants of employment, wage and price setting decisions in Greek manufacturing. For

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The usual disclaimer applies.

TABLE 1

SOME KEY SERIES FOR GREEK MANUFACTURING

Year	Rate of Employment (Δn)	Change in Output (Δy)	Change in Real Wage $\Delta (w-p)$	Manufacturing Oil Price $\Delta (p_f-p)$	Manufacturing Competitiveness $\Delta (p^*-p)$
1956	0.004	0.006	0.050	− 0.006	− 0.061
1957	0.004	0.080	0.066	− 0.003	0.037
1958	0.004	0.099	0.052	0.001	− 0.040
1959	0.004	0.010	− 0.012	− 0.012	− 0.041
1960	0.004	0.094	0.035	− 0.004	− 0.022
1961	0.004	0.048	0.080	− 0.003	− 0.014
1962	0.013	0.050	0.035	− 0.002	0.000
1963	0.018	0.111	− 0.003	− 0.004	− 0.053
1964	0.044	0.100	0.079	− 0.006	− 0.002
1965	0.029	0.079	0.072	− 0.001	0.011
1966	0.019	0.136	0.078	− 0.002	− 0.036
1967	− 0.008	0.026	0.099	− 0.001	− 0.012
1968	0.002	0.070	0.070	− 0.002	0.000
1969	0.032	0.107	0.065	− 0.003	− 0.012
1970	0.062	0.102	0.026	− 0.001	0.010
1971	0.058	0.095	0.048	0.015	0.029
1972	0.050	0.143	0.029	0.005	− 0.004
1973	0.023	0.148	− 0.065	0.009	− 0.024
1974	0.021	− 0.020	− 0.032	0.072	0.093
1975	− 0.013	0.044	0.137	0.005	0.067
1976	0.039	0.100	0.124	0.005	0.013
1977	0.022	0.015	0.058	− 0.003	− 0.030
1978	0.037	0.073	0.117	− 0.005	0.008
1979	0.036	0.059	− 0.005	0.007	− 0.011
1980	− 0.007	0.010	− 0.008	0.029	0.090
1981	− 0.029	− 0.013	0.008	0.011	0.017
1982	− 0.023	− 0.053	0.142	0.005	0.001
1983	0.005	− 0.004	− 0.004	− 0.003	0.043
1984	− 0.008	0.022	0.040	0.002	0.029
1985	0.028	0.012	− 0.006	− 0.002	− 0.002
1986	0.053	− 0.007	− 0.045	− 0.057	− 0.058
1987	− 0.000	− 0.021	0.031	0.009	− 0.024
1988	0.032	0.050	0.068	− 0.019	0.010
1989	0.011	0.023	0.031	0.014	0.014
1990	− 0.007	− 0.028	− 0.019	0.012	0.031

this purpose I based on the theoretical framework analyzed by Layard and Nickell (1986) who model the product market in an imperfectly competitive ground while in labour market they allow wage setting to be determined far from the market 'clearing' conditions.

The model was estimated with annual published data for the period 1956-90, by instrumental variables and three stage least squares techniques, and has been thoroughly tested for possible deviations from assumed statistical properties. Thus, Section 2 presents the theoretical framework, while Section 3 presents the econometric specification of the model. Section 4 analyzes the results and evaluate the model; and finally Section 5 sums up the conclusions.

2. *The Theoretical Framework*

Suppose the economy consists of a number n of identical imperfectly competitive firms which set prices, produce output and fix employment on the basis of their expectations of the demand for their output. Each firm's final output is produced by a production function of constant returns to scale in which intermediate inputs (say energy) are separable from capital and labour. Hence, the ith firm's production of value added Y_i is determined by its capital (K_i) and its labour (N_i):

$$Y_i = f\left(\frac{AN_i}{K_i}\right) K_i \qquad (f' > 0, f'' < 0) \tag{1}$$

where A is assumed to be labour-augmenting technical progress. Reformulating (1) we get:

$$f'\left(\frac{AN_i}{K_i}\right) = 1/(f^{-1})'\left(\frac{Y_i}{K_i}\right) \tag{2}$$

which implies that the marginal product of labour equals the reciprocal of the marginal cost of output measured in terms of labour.

In order to choose a price and thus determine its output and employment, the firm must forecast demand. But the actual output that the firm expects to sell (Y_i^e) will be less than full capacity output, since expected aggregate demand is only a fraction (σ^e) of that. If we assume for simplicity that output equals expected demand, then the firm's output equals

$$Y_i = D(\sigma^e) f\left(\frac{AN}{K}\right) \frac{K}{n} \tag{3}$$

We now turn to the price setting. Consider a pricing rule in which P_i is a mark-up ν on expected marginal costs.

$$P_i = \nu \frac{W}{A} (f^{-1})' \left(\frac{Y_i}{K_i} \right) \tag{4}$$

where W is the cost per worker. If the firm maximizes short-run profits, then $\nu = \left(1 - \frac{1}{x} \right)^{-1}$ where x is the elasticity of demand facing the firm. This includes the polar cases of perfect competition ($\nu = 1$) and normal cost pricing ($\nu = 0$).

Moving now to the level of aggregate economy we subpress the model of (2), (3) and (4) to a price and an employment equation. We get (a) by (3) and (4) a price equation

$$\frac{P}{W} = g_1 (\underset{+}{\sigma^e}, \underset{+}{N/K}, \underset{?}{A}) \tag{5}$$

which implies that an increase of the labour-capital ratio will produce an increase of price over wage. We also expect $\partial g_1 / \partial \sigma^e > 0$ in all cases except the normal cost pricing one, where $\partial g_1 / \partial \sigma^e = 0$.
(b) by (2) and (4) we get a marginal productivity condition which generates an employment equation of the form

$$\frac{N}{K} = \frac{1}{A} g_2 (\underset{-}{W/PA}, \underset{+}{\sigma^e}) \tag{6}$$

which suggests that when the real cost of labour increases employment falls relative to capital but increases when demand expectations are high.

We turn next to wage formation. I assume that either unions set wage (monopoly union model) or that firms and unions are bargaining over wage (right to manage model) but in both cases employment is fixed by employers (for which there will be some empirical support by the data). Thus,

$$\frac{W}{P} = g_3 (\underset{+}{\sigma^e}, \underset{+}{K/N}, \underset{+}{P_c/P}, \underset{-}{P_f/P}) \tag{7}$$

which means that workers aspirations over real wages increase with the level of macroeconomic activity, labor productivity, and the wedge between real labour costs and real take-home pay (P_c/P). On the other hand employers are less willing to agree on wage increases, when labour market is tight,

labour hoarding is high, and relative input costs (say real energy price, P_f/P) are increasing (see eg. Alogoskoufis and Manning, 1991).

Layard and Nickell (1986) showed that this model which is built up in a neo-classical framework of marginality, turns out to be quite non neo-classical in equilibrium, since wage determination is not based on market clearing. To prove that, they proceed to some comparative static exercises, excluding priorly expected demand from wage equation, in order to shorten the revealed disequilibrium gap. Here, I will apply the same exercise assuming only normal cost pricing conditions. The $\{W/P, N\}$ space diagram presents the wage, employment and price decision loci at the initial equilibrium E_0. A temporary demand shock will shift left and upwards the wage curve and right and upwards the employment curve, while price setting will remain unaffected. Hence, there is a gap between the wage that workers will ask (at E_1') and that (at E_1) which firms are willing to pay based on their pricing rule. The new disequilibrium position in the E_1E_1' space is rather uncertain and this is a problem that a dynamic simulation on the estimated model will try to sort out.

The model we discussed determines the level of employment and output for given values of the real exchange rate. However in order to define the long-run level of employment and output we should complement the model with an equation for competitiveness P^*/P, where P^* is the price of the competitive (but imperfect substitute) foreign good in domestic currency. Thus, we assume that competitiveness is determined by the demand conditions domestically (Y) and abroad (Y^*) and a number of exogenous factors (say oil price in dollars P_f/E):

$$\frac{P^*}{P} = g_4 \underset{+}{(Y}, \underset{-}{Y^*}, \underset{?}{P_f/E}) \tag{8}$$

3. *The Empirical Framework*

The theoretical model analyzed in the previous section consists of equations (5), (6), (7) and (8). We are going to specify and estimate the first three equations, leaving the effect of long-run competitiveness determination to be modelled implicitly through the instruments set. Low case letters are natural logarithms of capital letters.

The dynamic version of employment equation (6) has the form

$$n-k = \alpha_0 + \alpha_1 (n-k)_{-1} + \alpha_2 (w-p) + \\ + \alpha_3 s_F (p_f-p) + \alpha_4 (p^*-p) + \alpha_5 y \tag{9}$$

where competitiveness and manufacturing output terms represent the demand effects ($\alpha_4, \alpha_5 > 0$), the real oil price incorporates the effect ($\alpha_3 < 0$) of the energy input price and should not be excluded despite the separability assumption in production function (see Oi, 1985), while the effect from real wage ($\alpha_2 < 0$) has already been discussed. s_F is the share of energy input in gross manufacturing output, assumed constant equal to 0.07, which could not be far from reality (see Alogoskoufis, 1989). Technical progress will be assumed constant and will not be modelled explicitly. Experiments with residuals based approximations of technical progress were completely unsuccessful. The employment equation will be also estimated in an error correction form with the rate of change of employment Δn as dependent variable.

Wage equation (7) was estimated in both bargained wage and monopoly union wage setting specifications.

$$w-p = \beta_0 + \beta_1 (w-p)_{-1} + \beta_2 (k-n) + \\ + \beta_3 (p_c-p) + \beta_4 s_F (p_f-p) + \beta_5 y \qquad (10)$$

where $\beta_2, \beta_3, \beta_5 > 0$ and $\beta_4 < 0$. Manufacturing output was preferred as a measure of macroeconomic activity instead of the unemployment rate, because data for the latter is quite unreliable (see also Alogoskoufis, 1989) and experiments to include it in the regression were unsuccessful. Equation (10) is tested against the hypothesis $\beta_3 = \beta_5 = 0$ for the monopoly union model. Wage equation includes also a linear time trend, which accounts for the unmodelled trending factors and in the monopoly union specification a $\Delta\Delta p_c$ term accounting for price surprises.

Finally, price equation (5) is estimated in an error correction form which includes a constraint that ensures long-run homogeneity between prices and wages.

$$\Delta p = \tau_0 + \tau_1 (p - (1 - s_F) w - s_F p_f)_{-1} + \tau_2 (k - n) \\ (\tau_1, \tau_2 < 0) \qquad (11)$$

Price equation includes a time trend polynomial in order to account for the unmodelled trending factors of the model.

The system of (9), (10), (11) was initially estimated by two-stage least squares. As instruments I have used the {constant, time, $(\text{time})^2$, $(\Delta\Delta p_c)_{-1}$, $D82$, $D86$, Δn_{-1}, $(k-n)_{-1}$, y_{-1}, $(p_c-p)_{-1}$, $(p_f)_{-1}$, p^*_{-1}, $(w-p)_{-1}$, y^*_{-1}}, where as y^* was used the index of world exports in US dollar terms; $D82$ and $D86$ are two dummy variables (the first takes the value of one in 1982

and the second does it in 1986, zero elsewhere), which account for the 1982 wage explosion and the 1986 incomes policy respectively.

The equations have been estimated for the period 1956-90 using published data for Greek manufacturing (see data appendix). Instrumental variable estimates have been tested for possible deviations from the assumed statistical properties of non-autocorrelation in residuals, linearity, homoskedasticity and absence of autocorrelation conditional heteroskedasticity. I have also tested for the existence of overidentifying restrictions in the structural form equations (see appendix for diagnostics). These Reset-type tests are asymptotically distributed as χ^2 (i) and are based on the Lagrange-multiplier Principle. The F-form of the above tests is preferred as a better approximation to the corresponding χ^2 for small samples (see Spanos, 1986). Degrees of freedom are corrected appropriately in each case, in order to account for the assumption of orthogonality between the residuals and the fitted values. Finally, I have applied two Chow tests with break points,

TABLE 2

2SLSQ ESTIMATES FOR EMPLOYMENT EQUATION: 1956-90

	Δn	$n-k$
constant	− 1.31 (4.6)	− 1.36 (4.2)
Δn_{-1}	0.37 (2.5)	–
$(w-p)$	− 0.08 (1.7)	− 0.11 (2.2)
$s_F(p_f-p)$	− 0.58 (2.6)	− 0.88 (4.1)
$p^*-p)$	0.15 (1.5)	0.24 (2.3)
y	0.29 (4.6)	0.30 (4.2)
$(n-k)_{-1}$	− 0.66 (5.1)	0.37 (2.6)
R^2	0.73	0.99
s	0.01	0.01
LM1	1.2	0.2
LM2	0.6	0.1
LIN	0.1	0.7
HET	0.3	0.9
ARCH1	0.1	0.1
ARCH2	0.1	0.8
BASM	1.6	2.1
CHOW74	2.0	2.5
CHOW67	0.4	1.3

NOTES: Absolute t-statistics in parentheses besides the estimates, and degrees of freedom besides the F-tests.

* means rejection of null hypothesis at 5% s.l.

TABLE 3

2SLSQ ESTIMATES FOR REAL PRODUCT WAGE $(w-p)$ EQUATION: 1956-90

	I	II	III	IV	V
const.	− 3.19 (3.0)	− 1.77 (2.6)	− 2.47 (2.4)	− 0.95 (1.3)	− 1.80 (2.4)
time* 10^{-2}	1.89 (2.6)	0.91 (1.7)	1.18 (1.6)	0.20 (0.3)	0.72 (1.2)
$\Delta\Delta p_c$	–	–	− 0.57 (2.2)	− 0.47 (1.9)	− 0.37 (1.6)
$D82$	–	–	–	–	0.07 (1.6)
$D86$	–	–	–	–	− 0.10 (2.6)
$(k-n)$	1.34 (2.4)	0.64 (1.8)	1.08 (2.0)	0.31 (0.9)	–
$(k-n)_{-1}$	–	–	–	–	0.75 (2.1)
(p_c-p)	4.26 (1.6)	–	4.95 (2.0)	–	–
$s_F(p_f-p)$	− 0.26 (1.6)	–	− 0.74 (2.1)	–	–
y	0.58 (2.8)	0.33 (2.4)	0.47 (2.4)	0.20 (1.5)	0.35 (2.5)
$(w-p)_{-1}$	0.43 (4.2)	0.60 (4.2)	0.64 (3.6)	0.80 (5.0)	0.68 (4.2)
R^2	0.99	0.99	0.99	0.99	0.99
s	0.04	0.05	0.04	0.04	0.03
$LM1$	3.8	2.1	4.1	1.5	3.7
$LM2$	2.8	2.4	2.2	1.1	2.0
LIN	0.2	0.6	0.1	0.6	0.4
HET	1.2	1.9	2.8	1.9	1.1
$ARCH1$	1.1	1.3	1.9	0.1	0.1
$ARCH2$	1.8	0.9	0.9	0.7	0.1
$BASM$	2.1	2.1	1.7	3.1	1.4
CHOW74	1.2	1.0	0.6	0.5	1.0
CHOW67	0.3	0.5	0.5	0.3	0.5
F-test for $H_0:\beta_3=\beta_4=0$		3.5*		1.5	

1967 for the first and 1974 for the second in order to test parameters' stability across time.

Taking as initial values the 2SLSQ estimates, I proceed to a three-stage least squares estimation of the model. At this stage I tested for two cross equations restrictions accounting for the long-run K/N 'neutrality' implied by the production function equation (1): $\tau_2/\tau_1 = -(1-\alpha_1)/\alpha_2$ and $\beta_2 = -(1-\alpha_1)/\alpha_2$. Finally, based on these 3SLSQ estimates I applied a dynamic simulation exercise investigating the effect on employment and real wage of the temporary demand shock discussed in comparative statics of Section 2.

Thus, Tables 2, 3 and 4 present the 2SLSQ estimates of employment, wage and price equations respectively, Table 5 the 3SLSQ estimates restricted and unrestricted, using the two alternative forms of wage setting

TABLE 4

2SLSQ ESTIMATES FOR PRICE (Δp) EQUATIONS: 1957-90

	I	II
constant	0.33 (2.1)	0.51 (2.1)
time* 10^{-2}	− 0.83 (1.6)	− 2.02 (1.6)
(time)^{2*} 10^{-4}	−	1.92 (1.0)
Δp_{-1}	0.50 (3.3)	0.51 (3.3)
$(k-n)$	− 0.20 (1.6)	− 0.40 (1.7)
$(p - 0.93^{*} w - 0.07^{*} p\beta)_{-1}$	− 0.18 (1.6)	− 0.20 (1.8)
R^2	0.72	0.73
s	0.05	0.05
*LM*1	0.2	0.2
*LM*2	2.4	2.8
LIN	0.4	1.0
HET	1.2	1.1
*ARCH*1	7.5*	7.0*
*ARCH*2	3.6*	3.3
BASM	1.1	1.0
*CHOW*74	0.5	0.5
*CHOW*67	0.4	0.4
F-test for H_0: coeff $(y)=0$	0.4	1.4

specification; while Table 6 gives the results of the dynamic simulation exercise.

4. *Estimation and Testing*

Estimated equations exhibit remarkably high explanatory power and considerably small standard errors. Specification tests show that all equations are well specified. Few of the assumed optimal statistical properties are violated at 5% s.l. The Basmann statistic shows that the implied overidentifying restrictions can not be rejected in any of the structural form equations, while Chow tests can not manifest serious structural breaks across time.

In labour demand equations the estimate of sluggishness in the adjustment coefficient appeared to be around 0.35, while all independent variables revealed a statistically significant impact on employment. Long run coefficients are − 0.17 for real wage, − 1.3 for real oil price, and 0.37 and 0.46 for competitiveness and demand for output respectively. Estimates on

TABLE 5

3SLSQ ESTIMATES OF THE MODEL

α_0	− 1.46 (5.1)	− 0.57 (2.2)	− 1.50 (5.3)	− 1.55 (4.7)
α_1	0.35 (2.8)	0.90 (16.)	0.33 (2.7)	0.43 (3.3)
α_2	− 0.13 (3.1)	− 0.11 (2.0)	− 0.13 (3.1)	− 0.19 (4.2)
α_3	− 0.94 (4.9)	− 0.81 (3.2)	− 0.96 (5.1)	− 1.11 (5.1)
α_4	0.28 (3.1)	0.25 (2.1)	0.28 (3.1)	0.38 (3.7)
α_5	0.33 (5.1)	0.13 (2.2)	0.34 (5.3)	0.35 (4.7)
β_0	− 1.56 (2.5)	− 2.13 (3.7)	− 3.77 (4.4)	− 6.24 (6.5)
$\beta_{01}{}^{*} 10^{-2}$	0.56 (1.1)	0.78 (1.7)	1.77 (3.1)	3.03 (4.1)
β_{02}	− 0.26 (1.2)	− 0.26 (1.7)	−	−
β_1	0.69 (4.9)	0.60 (4.8)	0.42 (3.3)	0.14 (0.9)
β_2	0.60 (1.9)	0.90 (RESTR)	1.67 (3.7)	2.91 (RESTR)
β_3	−	−	2.83 (1.5)	7.32 (2.5)
β_4	−	−	− 0.72 (2.2)	− 1.46 (3.9)
β_5	0.31 (2.6)	0.42 (3.7)	0.71 (4.2)	1.17 (6.2)
τ_0	0.62 (3.2)	0.57 (2.9)	0.69 (3.5)	0.73 (3.9)
$\tau_{01}{}^{*} 10^{-2}$	− 2.65 (2.6)	− 1.97 (2.1)	− 3.08 (3.0)	− 3.49 (3.4)
$\tau_{02}{}^{*} 10^{-4}$	2.86 (1.9)	1.43 (1.2)	3.50 (2.3)	4.28 (2.9)
τ_{03}	0.44 (3.2)	0.41 (2.9)	0.47 (3.5)	0.51 (3.7)
τ_1	− 0.23 (2.2)	− 0.29 (2.9)	− 0.25 (2.4)	− 0.23 (3.9)
τ_2	− 0.50 (2.5)	− 0.26 (RESTR)	− 0.59 (2.8)	− 0.67 (RESTR)
$E'HH'E$	45.7	27.6	37.8	49.2
Cross-eqs restrs: $\chi^2(2)$		22.2*		11.4*
Employment eq. Diagnostics				
s	0.01	0.02	0.01	0.01
DW	1.84	1.50	1.85	1.81
Real Wage eq. Diagnostics				
s	0.04	0.04	0.04	0.05
DW	1.41	1.30	1.30	1.13
Price eq. Diagnostics				
s	0.04	0.04	0.04	0.04
DW	1.75	1.70	1.80	1.75

NOTE: β_{01} = coeff (time), β_{02} = coeff ($\Delta\Delta p_c$), τ_{01} = coeff (time), τ_{02} = coeff (time^2) and τ_{03} = coeff (Δp_{-1}).

the reduced sample 1974-90 showed that for recent years the speed of adjustment has increased while the impact of demand and real oil price rose, while those from real wage and competitiveness fell.

TABLE 6

SIMULATION EXPERIMENT
A TEMPORARY DEMAND SHOCK ($y = 1$ in period 1, $y = 0$ elsewhere)

period	Simulated Values for		
	Employment	Nominal Wage	Output Price
1	− 0.102	2.117	1.747
2	− 0.136	0.591	0.255
3	− 0.125	0.479	0.173
4	− 0.114	0.433	0.155
5	− 0.104	0.395	0.141
6	− 0.095	0.359	0.129
7	− 0.086	0.327	0.117
8	− 0.078	0.298	0.107
9	− 0.071	0.271	0.097
10	− 0.065	0.247	0.088
11	− 0.059	0.225	0.080
12	− 0.054	0.205	0.073
13	− 0.049	0.187	0.067
14	− 0.045	0.170	0.061
15	− 0.041	0.155	0.055
16	− 0.037	0.141	0.050
17	− 0.034	0.128	0.046
18	− 0.031	0.117	0.042
19	− 0.028	0.106	0.038
20	− 0.025	0.097	0.035
21	− 0.023	0.088	0.031
22	− 0.021	0.080	0.029
23	− 0.019	0.073	0.026
24	− 0.017	0.067	0.024
25	− 0.015	0.060	0.022

Real wage adjustment appeared sluggish, especially when the price surprise term and the two dummy variables are included in the model. Zero restriction on β_3, β_4 coefficients of equation (10) is rejected at 5% s.l. in the first specification, but can not be rejected when the inflation surprise term is included in the model, which implies non-nested specifications for the second case. The demand effect appeared highly significant with a stable across specifications long-run unit coefficient. The productivity variable $(k-n)$ came out with an over two long-run coefficient when terms of the wage bargaining specification are included but its impact appeared reduced (long-run coefficient around one) when those terms are excluded.

Price equations reveal small price inertia (0.2) while past inflation has a significant impact on current rate of inflation. Labour productivity $(k-n)$ coefficient is statistically significant as well, with a long-run effect at the range of 1.5.

Three-stage least squares estimates do not considerably diverge from those reported previously. Nevertheless, cross equations restrictions for both specifications are clearly rejected at 5% s.l., which confirms the indications we had from the 2SLSQ estimates. The non-neutrality of the capital-labour ratio in the long-run might remind increasing returns to scale in production.

Based on the 3SLSQ estimates of Table 5:I specification, I proceed to a dynamic simulation exercise, assuming that demand for output y is shot in the first period by 100% and then returns to its preshock level. All variables were set to a baseline level of zero and the experiment is that demand is taking the value of 1 for one period. As Table 6 shows, real wage increases considerably from the beginning, which has a negative impact on employment. Thus, in the beginning they are closer to the E_1' point. As demand retreats to its preshock level, real wage falls and employment rises (moving towards E_1), although very gradually. This means that the wage setting curve shift is considerably larger than that of the employment curve. Hence, the model predicts that temporary positive demand shocks could reduce employment and rise real wages which are sluggishly returning to equilibrium.

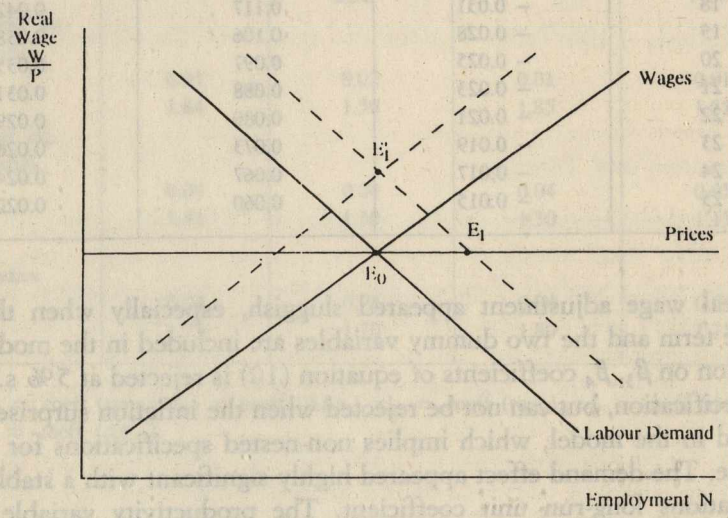

Diagram:

A Temporary Demand Shock

5. *Conclusions*

In this paper we developed and estimated a three-equation aggregate macroeconomic model for Greek manufacturing. It comprises both the demand and supply influences affecting employment and prices. We examined equations for the employment, pricing and output decisions of the firm, as well as for wage setting behaviour in the labour market. The equations have been estimated with two and three stage least squares for the period 1956-90 using annual published data. The estimated labour demand equations are consistent with this framework and generally have well defined real wage and demand effects. Wage equations reveal strong demand and productivity effects from which only the latter is influencing significantly the price setting. A break to the model is coming through the rejection of the long-run neutrality of capital-labour ratio hypothesis, which could remind of non-constant returns to scale in production.

DATA APPENDIX

N is manufacturing employment in manhours (*OECD Main Economic Indicators*).
K is capital stock in manufacturing, generated by the real manufacturing investment variable (*OECD National Accounts, Detailed Tables*), with a depreciation rate of 2% per annum.
Y is the manufacturing output index (*OECD MEI*).
P is the manufacturing output price index (*OECD MEI*).
P_c is the wholesale price index (*OECD MEI*).
P^* is the world manufacturing export price (*UN Monthly Digest of Statistics*) in domestic currency (*OECD MEI*).
P_f the oil price (*IMF Internat. Financial Statistics*) in domestic currency.
w is hourly earnings in manufacturing (*OECD MEI*).
Y^* world exports volume in US$ terms (*IMF IFS*).

APPENDIX FOR DIAGNOSTICS

The diagnostic statistics are defined as follows:

R2	is the coefficient of determination.
s	is the standard error of the regression.
DW	is the Durbin-Watson statistic.
E'HH'E	is the minimum distance criterion in the 3SLSQ procedure.
LM (*i*)	is the *F*-form of the *LM* test for residual autocorrelation up to i order, $i = 1,2$, and they are based on an auxiliary regression of the residuals on i lags of the residuals and the fitted values of the regression.
LIN	is the *F*-form of the RESET test for linearity, based on an auxiliary regression of the residuals on the level and the square of the fitted values.
HET	is the *F*-form of the RESET test for heteroskedasticity based on an auxiliary regression of the square residuals on the level and the square of the fitted values.
ARCH (*i*)	is the Autoregressive Conditional Heteroskedasticity test of Engle, order $i = 1,2$,

based on an auxiliary regression of the squared residuals on lagged squared residuals.

BASM is the Basmann test of the overidentifying restrictions implied by the structural forms, based on an auxiliary regression on all the instruments.

CHOW (j) is the *F*-type of the Chow test for the subsample *j* (*j* = 1967-90, 1974-90) against the whole sample 1956-90.

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SALARI, PREZZI E OCCUPAZIONE NELL'INDUSTRIA MANUFATTURIERA GRECA

Questo articolo cerca di esaminare la determinazione dell'occupazione, dei prezzi e dei salari nell'industria manufatturiera greca. In particolare i due aspetti fondamentali del modello qui sviluppato sono che le imprese imperfettamente concorrenziali sono in grado di fissare i prezzi e che i salari non sono determinati dall'equilibrio del mercato del lavoro. Le equazioni stimate sembrano funzionare abbastanza bene con salari reali ed effetti di domanda generalmente ben definiti nell'equazione dell'occupazione e un considerevole impatto della produttività del lavoro sul salario reale e il prezzo nelle equazioni più significative. Infine, le fluttuazioni della produzione hanno una influenza rilevante sui salari, ma non sui prezzi.